AN I-P-O MODEL OF TEAM GOAL, LEADER GOAL ORIENTATION, TEAM COHESIVENESS, AND TEAM EFFECTIVENESS

A Dissertation

by

CHIEN-FENG YU

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2005

Major Subject: Management

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Approved by:

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ABSTRACT

An I-P-O Model of Team Goal, Leader Goal Orientation, Team Cohesiveness, and Team Effectiveness. (December 2005)

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Based on a proposed input-process-output model of team goal, leader goal orientation, team cohesion, and team effectiveness, this study examined the influences of the leader trait goal orientation on the relationships between team goals and team cohesion. Results from 73 five-person teams working on an interdependent command and control simulation game indicated that team learning goal positively relates to team viability. Social cohesion mediates the effects of a team learning goal on team viability. In addition, the leader's learning orientation moderates the effect of a team learning goal on team task cohesion. Results of supplementary analyses are also presented. Theoretical and practical implications are discussed, as well as possible limitations and directions for future research.

DEDICATION

To Connie, Vinnie, and Maddi.

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CHAPTER I

INTRODUCTION

Organizations have increased their reliance on teams from the early 1980s to the present (Ilgen, 1999). A basic aspect of modern organizational life is there are less work assignments fully performed by one individual alone. Like individuals, these teams need to be developed as well as managed in order to benefit the organizations. Formally or informally, there is usually one leader role to guide the functioning of the teams in organizations today, in spite of the fact that many teams are "self-managed" (Zaccaro, Rittman & Marks, 2001) that are usually given specific goals and left alone. Given the prevalence and potential impact of leadership in teams, it is important that both researchers and practitioners have a better understanding of the relationship between team goals, team leadership, team cohesion, and team effectiveness outcomes.

Various leaders have different approaches towards their members in contrast to the traditional leadership (Yukl, 2002). "Tough leadership" (McIntyre & Salas, 1995) or strong-man type (Manz & Sims, 1991) leadership that has been characterized by sole decision making role of the leader, are usually not favored in today's organizations given that team members sometimes hold specific skills or resources that are critical to team success. Such members will probably resist the leader style that shares no decision-making discretion at all. Unfavorable team outcomes can occur if members are not satisfied with the team experience (e.g., dislike the leader) and the incurred costs to

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This dissertation follows the style of *Journal of Applied Psychology*.

organizations can and will be huge. In fact, it is not rare to see teams assigned with leaders lacking the specific functional knowledge necessary for accomplishing the team tasks given that team members already have what it takes (e.g., knowledge, skills, abilities) to do the jobs. This is reflected in both the essential leadership functions as organized by Fleishman et al. (1991) and the core tasks of the business leader as identified by Locke (2002). Plainly, none of these researchers considered functional knowledge or expertise to be a "must have" for a leader to perform effectively. A leader's work, typically, consists of directing, coordinating, and supervising the activities of group members for reaching a common goal. Despite how a person becomes an occupant of a leadership position, some researchers have proposed that a person's ability to motivate other persons may well be a function of personality (e.g., Fiedler, 1961).

Team Effectiveness

Since teams are characterized by a collection of, at a minimum, two or more individuals, there must be member task specialization, and members must interact or coordinate to achieve a common goal or outcome (Brannick & Prince, 1997; Dyer, 1984; Salas et al., 1992). In teams, there are usually differentiated roles and tasks to be performed. As a result, the fundamental feature of teamwork is coordination. In addition, teams can also be distinguished from groups because of the unique requirements for coordination and interdependency (Brannick & Prince, 1997). Forms of interdependence include task interdependence, goal interdependence, and outcome interdependence (Campion, Medsker & Higgs, 1993; Campion, Papper & Medsker, 1996). However, the

terms “teams” and “groups” are often used interchangeably in the literature (Ilgen, 1999; Kozlowski et al., 1996). In the end, the overall purpose of “teams” or “groups” is to achieve tasks members cannot fulfill as individuals, and they must be able to work effectively and efficiently together.

Researchers have suggested that team effectiveness can be broadly defined by performance, member satisfaction, and team viability (Guzzo & Dickson, 1996; Hackman, 1987; Sundstrom, De Meuse & Futrell, 1990). Accordingly, a) performance is indicated by team-produced outputs (quantity or quality, customer satisfaction, score achieved, and so on), b) member satisfaction is indicated by members’ pleasurable or positive affective attitude toward the team resulting from the team experience, and c) team viability is indicated by members’ capability to work together in the future. According to Sundstrom, De Meuse & Futrell (1990) team viability entails, at a minimum, members’ willingness to continue working together. The importance of team performance and team viability is straightforward given that they are directly related to the meaningfulness and the survival of the teams. That is, if there is no need for more than one person to perform the task, there will be no need for a team. In addition, if members of a team cannot work together, the specific team will no longer exist in the future. In contrast, the relationship between satisfaction and performance has fascinated organizational scholars for decades (Fisher, 2003). The importance of member satisfaction is in fact well supported by its found relation with performance (Ostroff, 1992; Schneider, White & Paul, 1998; Zohar, 2000). Implicit is the notion that member satisfaction causes performance because it is difficult to believe that teams will engage in any activity enthusiastically if members feel dissatisfied with team experience. If

members of the group reacted to the experience negatively, then the costs of performing the task successfully at the expense of team member satisfaction was probably too high (Hackman, 1987; Hackman & Morris, 1975). Fisher (2003) went further and addressed this pervasiveness of belief as a "commonsense theory." Although there is also scientific research that does not support the expected association between satisfaction and performance, Kluger and Tikochinsky (2001) have suggested some explanations. For instance, a strong relationship may exist at a higher or lower level of analysis, or at a longer or shorter time span, than that usually investigated by researchers. However, performance is equally likely to influence subsequent member satisfaction (Lawler & Porter, 1967). As a matter of fact, the search for a relationship between satisfaction and performance has been referred to as the "Holy Grail" of organizational behavior research (Weiss & Cropanzano, 1996). Yet, there is no research capable of clearly delineating the direction of causal relationship between the two, nor is it attempted by this study. At any rate, member satisfaction per se is still considered an important aspect of team effectiveness because of its relationship with team performance despite the controversy in research findings.

Leadership and Leader Traits in Teams

The high degree of coordinated interdependence that is inherent in teams also makes the leadership role critical. Team performance is usually not simply an additive function of individual member performance. *Process losses* (Steiner, 1972) are due to occur if no one is to facilitate the congruent, synchronous, and coherent actions across team members. This places a great deal of emphasis on team leaders as an important

factor in team effectiveness, especially in the early stage of team development when the teamwork pattern has yet to be established. Although there is substantial literature on leadership in organizations (Yukl & Van Fleet, 1992), the role of leaders in the development of effective teams is still not well articulated in the literature (Kozlowski et al., 1996). Definitions of leadership differ in many respects, and that is why Stogdill (1974) has concluded "…there are almost as many definitions of leadership as there are persons who have attempted to define the concept" (p. 7). Yukl and Van Fleet (1992) posited that leadership should be viewed "as a process that includes influencing the task objectives and strategies of a group or organization, influencing people in the organization to implement the strategies and achieve the objectives, influencing group maintenance and identification, and influencing the culture of the organization" (p.149).

It is proposed by Yukl and Van Fleet (1992) that it is not necessary to resolve the controversy over the appropriate definitions of leadership at this point in the development of the field. On the contrary, it is better to use the various conceptions of leadership as a source of different perspectives on a complex, multifaceted phenomenon. To be useful, leadership research should be designed to provide information relevant to the entire range of definitions instead of answering the research question of what makes a leader effective or ineffective. Kozlowski et al. (1996) concurred by suggesting that "leadership theories must seek more limited, middle-range explanations and be grounded by the defining characteristics of the contexts to which they apply." Interestingly, this suggested research trend of viewing leadership as an influencing process (Yukl & Van Fleet, 1992) seems to coincide with the situations in the world of work, which increasingly view leaders as coordinators, facilitators, or coaches (Manz & Sims, 1989).

As implied earlier, team tasks usually involve interdependence, and this interdependence makes the coordination among team members even more critical. Consequently, leader roles are now to ensure good coordination among team members given the popularity of ad hoc teams that are often formed to carry out a specific project in organizations nowadays. In this sense, what leaders are or do in team contexts can essentially be conceptualized as part of the process that links team input to team output.

Jago (1982) notes that leadership theories differ in terms of how leadership is conceptualized. Along this dimension theories may be conceptualized as being either trait- or behavior- based. Trait-based theories seek to measure the stable individual characteristics that differentiate leaders from non-leaders or effective leaders from non-effective leaders. As indicated earlier, it has been suggested that a person's ability to motivate other persons may well be a function of one or more personality attributes (e.g., Fiedler, 1961). Although Gibb (1954) pointed out the fact that numerous studies of the leadership personalities have failed to find any consistent patterns of traits that characterize leaders, he still acknowledged that leadership traits may well exist even though none has been recognized. Gibb offered an alternative explanation for this by suggesting that leadership is a complex job which probably does not call out a consistent pattern of functional roles.

In addition, one of the criticisms that trait approach in leadership research has received is that trait approach has failed to take situations into account (Northouse, 2004). People who possess certain traits that make them leaders in one situation may not be leaders in another situation. As a result, the findings on traits have been very extensive and broad, thus incapable of identifying a definitive list of leadership traits. An

alternative explanation, derived from the prior criticism, is that the behavior relevant to these leader's traits will manifest itself only under appropriate conditions. That is, unless the individuals are in a prominent position to influence their groups (i.e., leadership position), we would not expect to find the significance of a specific trait in directing, coordinating, and supervising the activities of group members for the purposes of attaining a common goal. Previous studies of leadership traits were concerned with the problem of differentiating leaders from non-leaders on the basis of various personality attributes. These studies showed that leaders differed slightly from non-leaders within their own groups in a number of attributes such as intelligence, height, and specific task-related skills (Fiedler, 1961). It is not difficult to see some of the reasons for the discouraging set of findings. A wide variety of reasons may have propelled a man into a leadership position, and many of these reasons are totally unrelated to personality attributes. Therefore, the specific traits in leaders that make the difference, if they exist, would therefore be masked by many effects and thus difficult to identify. A problem in the study of leadership traits that has been frequently overlooked is that the term *leader* is not precisely defined and has been interpreted broadly. As a result of this vague definition and interpretation of leadership, a person who occupies a leadership position even though he or she may in fact have little influence over the group members, elected representatives of the groups (e.g., congressmen), or persons who are foremost in their field of their endeavor can all be identified as leaders. It is important, in studies of teams (or small groups), that we cannot expect a relationship between the leader's personality trait and team behavior unless the individual in the leadership position is indeed able to influence his or her group. Therefore, it is essential that the person in a leadership

position is recognized by the team as its leader. Not just a figurehead, but a leader in fact!

Cohesiveness in Teams

Aesop's fable of the Bundle of Sticks reckons that "union gives strength." What is implied in the fable is the importance of cohesiveness in teams when facing external threat. This expectation is particularly upheld in the military setting. For example, in one of his writings to Henry Knox in 1798, George Washington stated "…*my first wish would be that my Military family, and the whole Army, should consider themselves as a band of brothers, willing and ready to die for each other*." Sociological analyses of small-group behavior suggest that small-group relations play a far greater role in determining what individuals will do (Griffith, 1988). Several researchers have also reported that the solidarity among members of small groups of soldiers rather than the strict discipline or extreme commitment to a political ideology contributed to the success of their units (e.g., Shils & Janowitz, 1948). Though the cohesiveness these researchers referred to had a social orientation, it is reasonable and logical to consider cohesiveness to be one of the favorable characteristics that leaders would like their teams to have.

Festinger, Schachter and Back (1950) described group cohesiveness as the "resultant forces which are acting on the members to stay in a group." In their theoretical treatment of the concept of group cohesiveness, there are two major classes of such forces: the attractiveness of the group for its members and the extent to which the group mediates goals for its members. From Festinger, Schachter and Back's (1950) description of cohesiveness, it is possible to infer that cohesiveness can be a critical

factor of team viability. Researchers have found a positive relation between cohesiveness and performance (Evans & Dion, 1991; Gully, Devine & Whitney, 1995; Mullen & Copper, 1994). The military traditionally values cohesiveness more than other organizations. Outside the military, positive effects of group cohesion have been reported in sports teams (Carron, Bray & Eys, 2002; Carron et al., 2002) as well as in various industry work groups (Mudrack, 1989b).

Many researchers have concurred that cohesion is a multidimensional construct that may include aspects of a social orientation and a task orientation (Festinger, Schachter & Back, 1950; Zaccaro & McCoy, 1988). The social aspect has reference to the needs of the person for affiliation, recognition, security, and other individual variables that can be satisfied by some facet of group participation while the task orientation aspect has reference to the objectives of the group. There is also a spiral escalating relationship between cohesiveness and norm conformity in team situations. In other words, if members are more cohesive towards each other, the more members are to conform to team norms. Conversely, the more members conform to team norms, the more cohesive a team may become (Festinger, 1950). Given its relationship with norm conformity, positive relationship with performance, and importance in team viability, group cohesiveness is one of the processes that researchers eagerly pursue in the investigation of characteristics of the small group. However, the focus is generally on the social aspect (Tziner, 1982).

Although highly cohesive teams can exert conformity pressure on members, this conformity pressure may not be positively related to team performance. Specifically, whether members support high or low productivity may not be related to how socially

cohesive teams are. While leaders want to make sure they have cohesive teams, they also need to make sure the direction of the conformity pressure is guided towards the desired course in order to capitalize on the benefits of teams. For example, Zaccaro and McCoy (1988) found that high levels of both types of cohesiveness (i.e., task and social) were necessary for a task requiring group interaction. Groups high on one type of cohesiveness but low on another did not perform better than groups low on both types of cohesiveness. Even with Zaccaro and McCoy's (1988) findings, the relationship between cohesiveness and performance is still not as systematic as we would expect. It is equivocal at best given the inconsistency in the definitions and measurement of cohesion and performance (Cota et al., 1995; Mudrack, 1989a; 1989b).

According to Kozlowski et al.'s (1996) model, team cohesiveness is what links the input factors (e.g., leader role behavior) and the effectiveness (i.e., output) of the team. Cohesiveness hence may very well be one of the critical constructs that link some of the leader characteristics to team output. Their approach has a primary human resource implication and their focus is more on the leaders' influence on team process and less on the direct effects in team outcomes. Kozlowski et al. (1996) suggested that their focus is parallel with the recent trend of leadership research, which advocates a shift toward conceptualization of leaders as facilitators and developers of role relations within teams instead of conceptualizing leadership as a controlling activity. In fact, as organizations move toward structuring work around self-managing groups and teams (Sundstrom, De Meuse & Futrell, 1990), leadership should be increasingly viewed as a developmental, facilitating role as opposed to a directive and controlling activity (Manz & Sims, 1989). The facilitating and developing roles of leaders in teams should therefore

be considered a critical part of the process that will link team input to team output. In the extant literature, however, there is no adequate amount of work done in investigating the relations between different dimensions of cohesiveness (Beal, Cable, Burke & McLedon, 2003). Nor is the influence of leader roles on the multidimensional cohesiveness development within teams adequately examined. This proposed study endeavors to fill this gap in the literature and to test the mediating role of cohesiveness in team framework as suggested in Kozlowski et al.'s (1996) model.

Roles of Goal and Goal Orientation in Teams

A goal is an object or aim of one's actions. Individuals with different goals will interpret and react to events in different ways. Furthermore, these different goals will lead to different patterns of cognition, affect, and behavior. Theorists have used the conception of goal orientation to describe the differences. Goal orientation refers to the mental framework for how a person responds to and interprets events and outcomes (Brett & VandeWalle, 1999). Two classes of goals that have been identified by researchers are learning and performance goals (Button, Mathieu & Zajac, 1996; Dweck & Leggett, 1988). They are defined and measured as a predilection for either maximizing performance, reducing mistakes, and meeting the expectation of key stakeholders (performance orientation), or for learning through experimentation and error, and taking risks to create knowledge that will enable adaptability (Gully & Phillips, 2005, in press).

It is important to note that goals include both a situational component and a more enduring personal component. On the one hand, researchers have found that, in

laboratory manipulation, situational demands can orient subjects toward different goals (Elliott & Dweck, 1988). On the other hand, survey research suggests that there are individual differences in the goal orientations that subjects hold, and these goal orientations are somewhat constant over time. In fact, research on individual differences has distinguished between trait-like constructs and state-like constructs. Trait-like constructs are not specific to a certain task or situation and are stable over time. On the contrary, state-like individual differences are specific to certain situations or tasks and tend to be more malleable over time (Chen, Gully, Whiteman & Kilcullen, 2000). Along this line of reasoning in categorizing individual differences, researchers have labeled goals (i.e., assigned goals) as state-like constructs (e.g., Locke & Latham, 1990) and goal orientations as trait-like constructs (e.g., Ackerman & Heggestad, 1997).

Ryan's (1970) idea that "conscious goals affect action" suggests the influence that goals may have on subsequent behaviors. However, individuals differ radically from one another in what specific goals they are pursuing, and hence, what behaviors enacted. Therefore, in team settings, team goals can ideally provide a focus of team members' collective effort. Goals serve as the ideal outcome for which team members strive. Such self-regulation efforts are continually required in the workplace for the accomplishment of various tasks or assignments. As a result, the link between goals and performance is apparent. Specifically, how effectively the goals direct the required attention and actions for accomplishing the tasks or assignments will eventually determine the team outcomes.

The relationship between goal orientation and performance has also drawn many researchers' interests (e.g., Ford et al., 1998; Gully & Phillips, 2005 in press; VandeWalle, Brown, Cron & Slocum, 1999). However, the conclusions about the

relationships of learning and performance goal orientations with task performance are still elusive. At the individual level, a learning orientation is characterized by a desire to master a task, while a performance orientation reflects a desire to demonstrate high ability and to receive positive evaluations (Ames, 1992; Dweck, 1986; Dweck & Leggett, 1988; VandeWalle & Cummings, 1997). Learning and performance orientations can create different frameworks for interpretations of situations and perceptions of self (Gully & Phillips, 2005, in press). Conversely, there is also growing evidence that factors related to the climate of a group can cultivate learning-oriented goals and/or behaviors among group members (Bunderson & Sutcliffe, 2003). Factors such as leadership, task characteristics, evaluation, and social discourse all have been found to have their effects on individual's goal orientation (Ames, 1992; Nicholls, 1984; Roeser, Midgley & Urdan, 1996; Turner et al., 2002). Extending this finding to team settings, we can expect that these factors will also have their effects on team goal orientation if all team members have been individually influenced. Moreover, a learning orientation is posited to encourage adaptive behaviors and lead to improved performance (Edmondson, 1999). Given the importance of task performance as one of focal outcomes to essentially all types of organizations, additional research is clearly necessary to help understand the array of relationships found between team goal orientation and task performance.

Teams are formed to perform tasks. As organizations structure their work around teams and groups, organizational scholars have also responded by shifting focus in organizations to groups and teams (Porter, 2002). However, it is also pointed out by Porter (2002) that the gaps between the popularity of teams and groups in organizations and the understanding of how to best utilize groups and teams still need to be reduced.

For instance, the shift from individuals to teams as the basic work unit has potentially added a role of team leadership, which can be one of the factors that have effects on team goals. Likewise, leader trait goal orientation will very likely interact with team goals to determine team outcome.

The theoretical framework shown in Figures 1 and 2 is formed according to the "input-process-output" (Gladstein, 1984; Hackman & Morris, 1975; McGrath, 1964) concept of team effectiveness. The basic rationale is that, at the input stage, teams assigned with specific goals will behave according to the goal content and these team goals will have their effects on the team output—team effectiveness (i.e., performance, team satisfaction, and team viability). The relationship between team goals and team effectiveness is posited to be partially mediated by the task and social aspect of team cohesiveness. Furthermore, the relationship between team goals, task, and social aspect of team cohesiveness is posited to be moderated by leaders' trait goal orientation because researchers have found that leaders can play a critical role in unit climate formation (Kozlowski & Doherty, 1989; Schein, 1985). Goal orientation has been considered as one of the important facets of unit climate perceptions (Gonzalez-Roma, Peiro & Tordera, 2002) and thus leader's trait goal orientation can logically be regarded as an influential factor in the relationship between team goals and team cohesiveness.

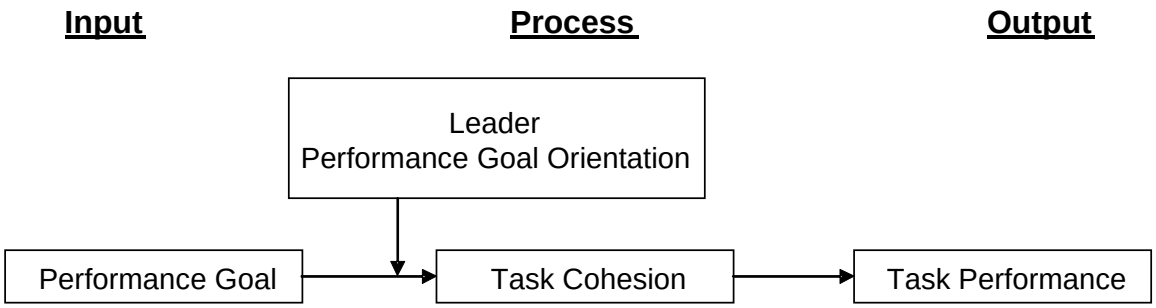

Figure 1. An I-P-O Model of Team Effectiveness (Performance Goal)

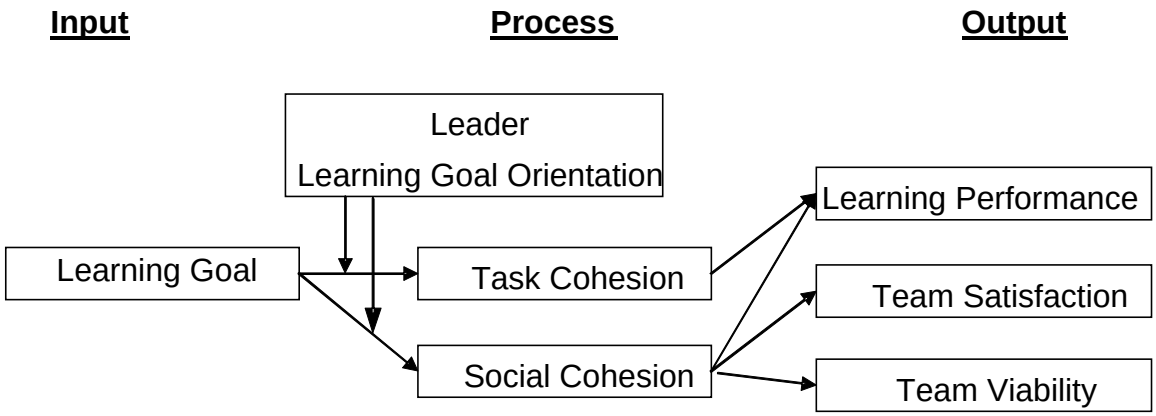

Figure 2. An I-P-O Model of Team Effectiveness (Learning Goal)

Specifically, in this study, team goals are manipulated such that either a learning goal, a performance goal, or no goal is assigned. The conceptualization of team goal orientation is based on a two-dimensional operationalization, which is consistent with pervious research (e.g., Button, Mathieu & Zajac, 1996; Farr, Hofmann & Ringenbach, 1993). Although goal orientation has been proposed to be a more-than-two-dimension construct (e.g., VandeWalle, 1997), the two-dimension construct is chosen not only for

its well establishment in the literature but also for the fact that it has been successfully applied in team level studies (e.g., Bunderson & Sutcliffe, 2003). The relationship between team goals and team effectiveness is examined as well as the proposed mediator, task- and social-cohesion. Additionally, leader's goal orientation as a trait-like construct (Ackerman & Heggestad, 1997) is also investigated to see its influence on the team cohesiveness development in the situation where the team already has been assigned a goal.

Summary

In organizations, teams are formed to carry out tasks that typically cannot be performed by an individual alone. Interdependence, a characteristic of team task, is usually required as well as critical to team task performance. While goals are used to facilitate team performance, leader role also serves as a facilitator of the team processes, such as the interdependence among team members. Therefore, unique individual difference such as the leader's trait goal orientation can have certain effects on the team processes, and eventually on the team effectiveness. In an input-process-output framework, cohesiveness provides a link between the input factors and output factors in the team context.

Contributions to the Literature of the Proposed Model

There are several potential contributions to the literature from the proposed model. First, in line with the dominant input-process-output team effectiveness model

(Gladstein, 1984; Hackman & Morris, 1975; McGrath, 1964;), team goals are treated as the focus inputs. Given the prominence of groups and teams in organizations, information related to team goals is increasingly valuable (O'Leary-Kelly, Martocchio & Frink, 1994). Moreover, this model represents an effort to examine the influence of team goals on team effectiveness compared to most extant studies of group goals that only look at the influence of team goals on performance (cf. Locke & Latham, 1990; O'Leary-Kelly, Martocchio & Frink, 1994). In contrast to previous studies on team composition that looked at factors such as individual traits (Barrick et al., 1998) and some nondemographic composition characteristics (Campion, Medsker & Higgs, 1993; Campion, Papper & Medsker, 1996), this study contends that individuals may differ in their trait goal orientations but are capable of pursuing similar goals in a particular situation in response to the goals emphasized in those situations. Furthermore, the complexity in contexts where there is a leader role will be explored. Particularly, the interaction between leader' trait goal orientation and team goals and the subsequent influences of this interaction may have upon team cohesiveness development and team effectiveness are investigated.

Second, the trait goal orientation literature generally discusses how learning and performance goal orientations lead to differential response patterns (Dweck & Leggett, 1988). In organizations, learning and performance orientations manifest themselves at multiple levels. At the individual level, these orientations can reflect both dispositions and states. This study specifically focuses on investigating what influence of team leaders' trait goal orientation may have upon team outcomes. Since group leaders and

the group's functional purpose can both have a strong influence on the development of norms within teams, the investigation of the interaction between team goals and leaders' trait goal orientation should provide some interesting insights into the relationship between these two not interchangeable concepts.

Third, as indicated earlier, despite the debate of which component of cohesiveness actually leads to performance, quite a few studies support positive relationships between cohesiveness and performance (Evans & Dion, 1991; Gully, Devine & Whitney, 1995; Mullen & Copper, 1994). In addition, it is established in the literature that cohesiveness is a multidimensional construct (Festinger, Schachter & Back, 1950; Zaccaro & McCoy, 1988). It is evident in the literature that previous studies have focused their efforts on the relationship between cohesiveness and performance. To date, however, there has been no specific attempt to directly and wholly examine the relationship between team goals, team cohesiveness development, and team effectiveness in an input-process-output framework. This study's framework aims to develop a heuristic model that addresses the roles of team goal and leaders' trait goal orientation in developing multidimensional cohesiveness and their eventual effects on effectiveness in team contexts.

Fourth, this study investigates beyond cohesiveness-performance effect by scrutinizing the relationships between dimensions of cohesiveness (i.e., task and social) and three aspects of team effectiveness (i.e., performance, team satisfaction, and team viability). Thus, it presents a more complete portrait than extant cohesiveness-performance studies. There is little question that in many cases performance of a team

cannot represent its effectiveness. As such, this study may provide more insights than the extant literature on cohesiveness-performance effect.

Finally, the model presented in this study is designed in line with Yukl and Van Fleet's (1992) suggestion that leadership research should be designed to provide information relevant to the entire range of leadership definitions by comparing the utility of different conceptualizations of leadership and arrive at some consensus of the matter in the literature. Even though the subject of leadership has been under study for decades, the overall picture is still vague. One of the reasons could be that context of the leadership is usually not considered seriously in previous studies (Zaccaro & Klimoski, 2001). This study will focus on the early stage of team development to investigate the effects leaders' trait goal orientation may have on cohesiveness development within the team. It is not intended nor is it possible to provide a comprehensive concept of leadership in all team situations. However, our understanding of leadership will surely be enhanced if pieces of information are found from investigation of different temporal stages of team development. Moreover, by looking into how individual differences of a person in a leadership position can influence cohesiveness development within the team and its eventual relationship with team effectiveness will certainly advance what we currently know about leadership.

In this study, an unprecedented attempt is made to investigate the interactions between leader trait goal orientations and team goals. Particularly, I will examine their interactive effects in fostering different dimensions of cohesiveness development within

teams and the subsequent influences upon team effectiveness. Research questions that stimulate the model delineated as Figures 1 and 2 are:

- How does the leader's trait goal orientation interact with team goals to influence cohesiveness development?
- What are the roles of social and task dimensions of cohesiveness in linking team goals to team effectiveness?
- Does cohesiveness mediate the input factors (i.e., team goals) to various aspects of team effectiveness (i.e., performance, member satisfaction, and team viability)?

Outline for the Following Chapters

The next chapter will serve as the initial step in investigating the research questions of this study by reviewing the extant literature on various subjects such as goal setting, goal orientation, and cohesiveness in teams. This review will provide a framework from which the subsequent discussion of this study will be based. This review will provide an indication of how little is currently known about the interaction between leader's trait goal orientations and team goals, and its ultimate effect upon team effectiveness in general. In Chapter III, explicit hypotheses will be provided regarding the interactions between leader's trait goal orientations and team goals and the subsequent cohesiveness development in teams. In addition, the different team effectiveness outcomes that may result from different dimensions of cohesiveness will also be discussed. While previous research has focused on team performance, I will

further investigate the effects that different dimensions of cohesiveness may have on member satisfaction and team viability as well. Chapter IV describes the research method and several measures that will be used to test the hypotheses developed in the previous chapter. Chapter V will report the results of the tests for the hypotheses proposed in this study. Finally, Chapter VI will discuss the findings of this study, its implications, and of course, its limitations.

CHAPTER II

A REVIEW OF THE LITERATURE ON GOALS, COHESIVENESS, AND GOAL ORIENTATION IN TEAMS

Goals

Despite the fact that other physiological drives may exist for human actions, Ryan (1970) argued that it is a simple fact that human behavior is affected by "conscious purpose, plans, intentions, tasks and the like" (p. 18). The ideas of Ryan essentially stimulated the stream of goal-setting research for nearly four decades (Locke & Latham, 2002). Evidence from empirical research has also provided support to the premise of goal-setting theory that *persons assigned difficult and specific goals outperform persons provided "do your best" goal assignments* (Latham & Lee, 1986; Mento, Steel & Karren, 1987; Tubbs, 1986). In fact, Locke and Latham (1990), based on several assessments by various researchers including themselves, declared that "goal setting is one of the most valid, if not the most valid theory, of work motivation" (p. 47).

Research on goal setting prior to 1980 primarily focused on the individual level (Locke et al., 1981). Studies on goal-setting at the individual level usually have been conducted using quantitative, experimental designs in laboratory settings, though several studies have been conducted in field settings as well (Latham & Lee, 1986; Locke et al., 1981). At the individual level, subjects usually are given one goal to try for. It is, of course, understandable that individuals in real organizational settings can still have

multiple goals, but these have rarely been examined at the individual level in goal-setting studies (Locke & Latham, 1990).

It is widely accepted that goals can play a significant role in regulating human action at various levels of the organization. However, the phenomena of multiple goals are more evident and thus more recognizable at the organizational level. For example, in their famous book, "*In search of excellence*," Peters and Waterman (1982) reported that high performing firms in their studies all had multiple goals (e.g., customer service, quality, etc.). Because of the obvious difficulty of using controlled experimental designs, researchers have employed both correlational and observational methods and both quantitative and qualitative approaches in conducting their studies (e.g., Bourgeois, 1985; Bradford & Cohen, 1984; Donaldson, 1985; Peters & Waterman, 1982). Besides being different in content and method, goal research at the organizational level is not nearly as advanced as individual level goal research. In fact, goals at the organizational level have been criticized as being inadequate for describing organizational behavior (Locke & Latham, 1990). For one reason, it has been argued that formal organizational goals are "completely irrelevant to organizational behavior" and the irrelevance has limited "very considerably the degree to which organizations could be understood through their goals" (Georgiou, 1973).

The found irrelevance of goals at the organizational level could be very well due to the multiple levels and multiple goals that are so prevalent in organizations (Georgiou, 1973; Locke & Latham, 1990). Specifically, the existence of multiple levels and goals in organizations has largely vitiated the power of goals in explaining behaviors. Locke and

Latham (1990) pointed out that the existence of multiple goals also creates specific process questions. For example, how are multiple goals best integrated into the organization? Are different goals assigned to different people or are all goals assigned to all individuals? Furthermore, there is usually one goal at the individual level of goal research, while goal conflict may be the norm at the organizational level. Conflicts over goals create a number of questions that have not been of concern to individual level goal researchers (Locke & Latham, 1990). Finally, in support of the goal irrelevance contention at the organizational level, Mintzberg (1983) argued that when conflicts arise it will be impossible to make predictions about goal effects since goals may provide little direction when conflicts exist within the organization.

In addition to the differences that exist between individual level and organizational level goals, Locke and Latham (1990) also indicated other differences that exist between two different levels such as time horizon, goal commitment, etc. They strongly argued for the need of "a marriage" between individual and organizational research since each side can bring out a unique perspective and approach. Based on previous discussion, I suggest that group goal research can actually bridge the schism between individual level and organizational level goal research. At the outset, task groups form a link between the individual and the organization. Therefore, group goal research should be considered the "bridging" process in the scientific process, a process spanning the distance between observed facts (i.e., empirical findings of individual level goal research) on the one side and abstract thought (i.e., many proposed and unexamined hypotheses of organizational level goal research) on the other. The more unexplained

facts that researchers find, the greater the need for explanation, and the broader the resulting theory will be. As discussed earlier in this study, Locke and Latham (1990) indicated that organizational goals have been criticized for inadequacy in explaining organizational behaviors, thus the need for explanation is present and clear.

Literature on Team Goal

The 1980s saw heightened interest in teams embedded in public and private production or service organizations (Ilgen, 1999). It has been suggested in the literature that at least four types of goals exist in group contexts and there is very likely a circular-causal relationship among these four goals: (1) each member's goal for the group, (2) Group's goal, (3) group's goal for member, and (4) member's goal for self (Zander, 1971). Taking into consideration the possible simultaneous operation of these inconsistent goals, it is almost commonsensical to see why goal specificity is critically important to the group goal effect, particularly in groups where the co-existence of numerous and competing goals can lead to increased ambiguity. O'Leary-Kelly, Martocchio & Frink (1994), in a review of the group goal influence on group performance, found most studies employed specific group goals and groups that had specific goals did perform better than did groups with less specific goals.

O'Leary-Kelly, Martocchio & Frink (1994) also found that group goal studies report a similar goal effect regardless whether or not goal difficulty was examined in the study. They suggested two possible reasons for the similar results. First, goals involved in all studies were actually difficult and therefore it is reasonable to find no significant

difference between results of studies that did manipulate goal difficulty and those studies that did not do so. They particularly noted that most recent studies in their meta-analytic review were essentially very clear about the goal difficulty level studied.

Second, the use of difficult goals is just not as important to achieving a performance effect in group settings as it is for individuals. O'Leary-Kelly, Martocchio & Frink (1994) pointed to the fact that it is important to recognize that group contexts provide other stimuli to effort and persistence as well. For example, Locke and Somers (1987) have shown how a strong leader, through giving goals, providing feedback, giving direct and indirect communication, providing encouragement and criticism, and giving advice about strategy can get members to pursue a common goal. Also, Gibb's (1961) observation of training groups of small sizes suggested that the influence potential of a given member's act is a function of its consonance with the group goal system. Gibb indicated that group actions, once started, tend to persist and even to build up strength and persistence as the collective goal tends to subsume and to merge with the goals of individuals who identify with the course of action. Leader acts that are concurrent with the group goals tend to be influential. In other words, initiations or regulations that are consonant with the group goal system tend to be accepted and integrated into group work immediately. On the other hand, initiations that are dissonant with the group goal system tend to be ignored, misperceived, rejected, or accepted only under power or status pressure. The group contexts thus add complications to goal issues that are not observed at the individual level.

Although not yet as advanced as individual level goal research, researchers have certainly found positive relations between group goal effect and group performance (Locke & Latham, 1990; O'Leary-Kelly, Martocchio & Frink, 1994; Wegge, 2000). In addition, O'Leary-Kelly, Martocchio & Frink's (1994) findings suggested that, over time, in field settings, researchers have largely concentrated on exploring the group goal effect for organization members. According to O'Leary-Kelly, Martocchio & Frink (1994), the results of group goal research in field settings compare favorably with goal research at the individual level. Furthermore, the research trends can be seen as a sign of the generalizability of the group goal to organizational settings. However, despite the satisfactory findings of group goal research in field settings, some ubiquitous factors such as leader-related influences still have not been seriously considered by researchers. As will be seen in the following review of this literature, while the relationship between goal setting and team effectiveness has been of primary interest to those studying the effects of goal setting in teams, there is some recent evidence that seems to suggest that the some important mediators may also exist to facilitate the relationship.

The Relationships between Goal and Team Effectiveness

There has been extensive interest in the effects of group goals on both group performance and member attitudes (i.e., member satisfaction or willingness of members to work together in the future). In contrast to most of the previous work that has focused on performance *per se*, much of the recent work has demonstrated that group performance, member performance, and/or member satisfaction are enhanced by

collective agreement on a challenging goal (Durham, Knight & Locke, 1997; Johnson et al., 1997; Ludwig & Geller, 1997; Yammarino & Naughton, 1992). Generally, productivity and satisfaction do tend to be higher when groups have challenging performance goals (Locke & Latham, 1990; O'Leary-Kelly, Martocchio & Frink, 1994; Wegge, 2000). However, much of the recent work in this area has focused on exploring when and why group goals have effects on the group outcomes. For example, using a class scheduling task, Latham, Winter and Locke (1994) found that strategies developed by participants and their self-efficacy completely mediated the effect of a collective goal on performance. Participation in goal setting did affect self-efficacy, but did not affect performance relative to goals that are assigned by the tell-and-sell method. Nevertheless, Latham, Winter and Locke (1994) advocated that it would not be appropriate to conclude from the results of their studies that participative group goal setting (PGGS) *per se* has no motivational effect on performance. They noted that, in their studies, self-efficacy was significantly associated with the use of effective task strategies and contributed to task performance independently of task knowledge. In addition, self-efficacy was also affected by PGGS and was correlated with commitment. In sum, their results should be interpreted to suggest that self-efficacy may play a central role as a mediator of the relationship between goals and performance.

Other work by Wegge and colleagues (Wegge, 2000; Wegge & Kleinbeck, 1996) associate anxiety reduction as a key mediator of the PGGS-performance relationship. Wegge (2000) presents a model of PGGS that consists of mediator variables (e.g., group cohesion, identification with the group, potency beliefs) that explain why PGGS might

affect motivation and group performance, and moderator variables (e.g., group composition regarding fear of social comparison) that foster or hinder the development of these effects. Using a group brainstorming task, Wegge found that challenging group goals (assigned or participatively set) improved group performance, promoted identification with the group, and improved the readiness for *social compensation* (Williams & Karau, 1991). However, it was also found that there was no overall effect of PGGS on group performance.

Consistent with many previous findings, the positive effects of challenging group goals upon group performance were found in both Latham, Winter and Locke's (1994) and Wegge's (2000) studies. In Latham, Winter and Locke's (1994) study, efficacy beliefs may have played an important role in the relationship between goals and task strategies. What is worth mentioning is that it is assigned goals that served as guides and motivators for performance as goals can help build and strengthen a sense of efficacy, both among individuals and teams (Bandura, 1997).

In goal research, the effects of various goal-setting methods have usually been examined in combination with individual performance. Research has generally confirmed that goals work at the group level (Locke & Latham, 1990; O'Leary-Kelly, Martocchio & Frink, 1994; Wegge, 2000). To my knowledge, there are very few studies examining specifically why goals can enhance performance at the team level. The brief review of the empirical evidence reveals that there is still very limited understanding of the potential mediators between team goals and both team outcomes. More specifically,

what links group goals to team effectiveness? Therefore, it appears that more effort is needed in exploring the relationship between goal setting and team effectiveness.

Conclusions on Team Goals

There are still a lot more that research on team goals can contribute to the literature. For example, team goal research should serve well as the role of middle-range theory in the process of expanding goal research from the individual level to the organizational level. Middle-range theory is defined by Merton as "that lie(*s*) between the minor but necessary working hypotheses that evolve…in …day-to-day research and the all-inclusive systematic efforts to develop a unified theory" (quoted in Bourgeois, 1985, p. 443). The middle rangeness is a relative concept since it is a point that lies on a continuum somewhere between a single empirical generalization and a theory of broader scope. This relative nature underscores the possibility that future theory construction may produce a theory of greater scope and then transform the theory that previously had the greatest scope into a middle-range theory, and so forth (Bluedorn & Evered, 1980).

Despite Locke and Latham's (1990) suggestion that organizational goal research has been disappointing in explaining organizational behaviors, researchers have not systematically investigated the roles that team goals may have in expanding goal research to broader organizational levels. At least, to the best of my knowledge, no researcher has ever attempted to do so. The current state of interaction at various levels of goal research brings up the possibility that examination of team goal effects with the inclusion of some other stimuli that are also common at broader organizational levels

may represent a potential course of action to enhancing the soundness of organizational goal research. Building on previous research findings while exploring new factors that are present at higher organizational levels may potentially provide more insights into how and why team goals work or do not work.

Cohesiveness Research

The concept of cohesiveness has been studied extensively, particularly in the field of sociology and recently in the field of sport psychology. Most work on group cohesiveness seeks to either identify its sources or document its effect on group behavior or performance. Cohesiveness is known to have important consequences for individuals (Schriesheim, 1980) as well as performance in teams (Evans & Dion, 1991; Gully, Devine & Whitney, 1995; Mullen & Copper, 1994). Cohesiveness was first defined as "the resultant forces which are acting on members to stay in a group" (Festinger, Schachter & Back, 1950). Over the years, researchers have proposed alternative definitions and conceptual models of group cohesiveness. For example, some have defined group cohesiveness as "the resistance of the group to disruptive forces" (Gross & Martin, 1952) and some have defined it as "a dynamic process which is reflected in the tendency for a group to stick together and remain in the pursuit of its goals and objectives" (Carron, 1982)

Traditionally, cohesiveness has been described as a unitary construct, meaning that the effects of cohesiveness on any criterion variable will be the same even if sources of cohesion are different (Schachter, 1952). However, a number of researchers argue that

cohesiveness can actually result from interpersonal attraction, liking for or commitment to the group task, and group status (Festinger, Schachter & Back, 1950; Mullen & Copper, 1994). Another multidimensional view of group cohesiveness suggests that there are in reality different types of group cohesiveness where each type is a function of the dominant reasons why members join and maintain membership in a group (Gross & Martin, 1952; Hackman, 1987; Tziner, 1982). For example, task-based cohesiveness results when there is a "shared commitment to the task of the group" (Hackman, 1987) while social-based cohesiveness represents the degree to which positive interpersonal relationships exist among members of the group (Festinger, Schachter & Back, 1950).

Perhaps the most visible and active use of group cohesiveness over the years has been as a possible predictor of group performance (Mullen & Copper, 1994). The conceptual framework in this area was first outlined in the research of Schachter et al. (1951). Their basic assumption is that, if one relates to the group product as a function of the group's success in influencing its members, then cohesiveness constitutes a major causal factor of the performance level. It seems intuitively reasonable to expect a cohesive group to have positive performance relationship[1]. However, this ostensibly straightforward relationship may in actuality be more complicated than we expect. Earlier researchers were unable to find a systematic relationship between performance and cohesion (Steiner, 1972; Stogdill, 1972). Two meta-analytic studies concluded that a

[1]As depicted in Schachter et al. (1951), positive relationship denotes that cohesive group will put greater pressure on their members to increase productivity if the performance is assigned a high valence. Alternatively, if a cohesive group operates for the reduction of productivity, its performance will be of a lower level than that of a group which is not cohesive.

small but positive relationship between group cohesion and group performance existed (Evans & Dion, 1991; Mullen & Copper, 1994). Still, some subsequent studies disagreed with these meta-analyses on whether the cohesion–performance relationship was moderated by other variables such as level of analysis, task interdependency, and goal acceptance (Gully, Devine & Whitney, 1995; Podsakoff, MacKenzie & Ahearne, 1997).

The Relationships between Team Goal and Team Cohesion

In investigating the combined effects of interpersonal attraction and goal-path clarity (i.e., how explicitly the goal is formulated and how clear the paths for goal attainment are) on cohesiveness of task oriented groups, Anderson (1975) found that two classes of forces (i.e., the attractiveness of the group for its members and the extent to which the group mediates goals for its members (Festinger, Schachter & Back, 1950), *as discussed in Chapter One*) do in fact affect group cohesiveness independently. While the groups in Anderson's study were primarily task oriented, the results of his study suggest that one class of force, interpersonal attraction, may be dominant in socioemotional groups and the other class of forces, goal-path clarity, may be dominant in task-oriented groups in determining group cohesiveness. All in all, Anderson found that goal-path clarity plays an important role in the determination of cohesiveness in task oriented groups. Therefore, Anderson's study indicates that the group goal can in fact influence cohesion and that interpersonal attraction is not central to the cohesiveness of all groups. Furthermore, Anderson advocates that further research is needed to define more clearly the conditions under which each class of force is more important because group process

variables such as cohesiveness can be the product of a complicated and extensive set of variables whose interrelationships are just beginning to become clear.

Sport researchers Widmeyer and Ducharme (1997) argue that, similar to its effect on team performance, the team goal can also influence team cohesion through both direct and indirect routes. Goals facilitate performance by directing attention and action (Locke & Latham, 1984). Therefore, the goal can directly provide a focus that will promote intra-group communication and facilitate overall members' commitment and satisfaction, all of which have been shown to enhance team cohesion in sport (Widmeyer, Brawley & Carron, 1985). Indirectly, because successful team performance contributes to increased team cohesion, team goals influence team cohesion through their ability to increase performance. This relationship is perhaps circular in that the more cohesive a group, the more likely its members will be motivated to achieve its goals. Besides, Brawley, Carron and Widmeyer (1993) found that participation in team goal setting was significantly related to team cohesion. Nonetheless, what is of interest here in this study is the direct route of influence. That is, goals can enhance cohesion and which, in turn, has effects on team outcomes.

The Relationships between Team Cohesion and Team Effectiveness

The research literature generally deals with socio-emotional cohesiveness (i.e., cohesion that is based on personal attraction between individuals). However, Tziner (1982), a supporter of the multidimensionality of cohesiveness, suggested that different types of cohesion can be differently related to consequences such as group process and

productivity. Zaccaro and Lowe (1988), believing it is necessary to know both the level and the nature of cohesion in order to predict performance, investigated the effects of two types of cohesiveness. The results of their study indicated that: High task cohesion facilitated performance, while interpersonal attraction had no apparent effect on performance. Increases in interpersonal cohesion did, however, result in higher task commitment and more frequent interactions among group members.

As mentioned previously, the findings of two meta-analytic studies (Evans & Dion, 1991; Mullen & Copper, 1994) both show that there is a small but positive relationship between group cohesion and group performance. Evans and Dion (1991), viewing group cohesion as a unitary construct in their meta-analysis, gathered 27 published studies that contain a mixture of sports teams, experimental groups, and military units. Although eventually there were only 16 studies (18 effect sizes) included in their final analysis, they concluded their research with the suggestion that the relationship between cohesion and performance is indeed a positive one.

On the other hand, Mullen and Copper (1994), viewing cohesiveness as a multidimensional construct, provide a more comprehensive meta-analysis on the cohesion-performance relationship. Included in their study were 49 studies (52 independent effect size estimates) from various disciplines in psychology (e.g., industrial, sport, military, and social) as well. Important conclusions resulting from the Mullen and Copper meta-analysis are that: A cohesion-performance relationship is present when cohesion is operationally defined as commitment to task (i.e., analogous to task cohesion), but not when it is operationally defined as either interpersonal attraction

(i.e., analogous to social cohesion) or group pride. Nevertheless, Mullen and Copper also pointed out the possibility of the existence of a circular relationship between cohesiveness and performance. As they noted,

> Logically, either direction is plausible. On the one hand, group cohesiveness energizes and directs group members toward successful task completion. This has been the implicit assumption guiding most studies of the cohesiveness-performance effect. On the other hand, excellence in performance should make group members feel much better about the group. (Mullen & Copper, 1994, p.215)

There is a more recent meta-analytic study conducted by Beal et al. (2003) to clarify the relations between cohesion and performance constructs in groups. Included in their meta-analytic effort are 64 separate articles with 71 independent estimates. In addition to the findings that there are stronger correlations between cohesion and performance when performance was defined as behavior (as opposed to outcome as traditionally defined in previous studies), Beal et al. (2003), in contrast to Mullen and Copper's (1994) findings, argued that 3 main components of cohesion (i.e., *interpersonal attraction, task commitment,* and *group pride*) are independently related to the various performance domains. Beal et al. reasoned that performance behaviors are more closely linked to the process of cohesion than performance outcomes, which can be determined by factors unrelated to the efforts of the group. To further clarify the performance construct, Beal et al. also put forward that measure of *performance efficiency* will be more adept at capturing the process benefits of group cohesion. They

claimed that measures of performance effectiveness, defined as an evaluation of the results of performance with no consideration of the costs of achieving the results, only consider outputs that cannot fully reflect the effects of cohesion.

Also worth mentioning is that Beal et al. (2003) found a positive correlation between cohesion and contextual performance. Contextual performance generally includes "behaviors that do not support the technical core itself so much as they support the broader organizational, social, and psychological environment in which the technical core must function" (Borman & Motowidlo, 1993). Cohesive groups are more likely to experience higher levels of contextual performance that contain actions benefiting other members of a group (Lepine et al., 2000).

Conclusions on Cohesiveness Research

A feasible explanation for the confusion in the cohesiveness literature could be its multidimensionality. Studies on cohesiveness prior to Zaccaro and Lowe's (1988), although recognizing different forms of cohesiveness, have mostly relied on interpersonal attraction as the basis for manipulating group cohesion (McGrath, 1984). Tziner (1982) also indicated that the research literature generally dealt with *socio-emotional* cohesiveness that was based on personal attraction between the individuals. As a result, Tziner suggested that differentiation of cohesiveness types must be made in order to understand the distinct implications associated with each type of cohesiveness in the areas of small group research.

A conclusion that can be drawn from the review of the literature above is that cohesiveness and team outcomes are indeed related. While there have been inconsistent findings regarding the relationship, the multidimensionality of cohesiveness and various aspects of team outcomes (e.g., team performance, member satisfaction, and team viability) should be carefully investigated in order to comprehensively grasp the picture. Furthermore, investigation of the relationship between different dimensions of cohesiveness may provide some new insights of the construct.

Finally, the review of the literature above also implies the mediating role of cohesiveness in a team goal setting environment. Goals provide a focus of collective effort and attention (Locke & Latham, 1984). However, different types of goals (i.e., performance goal and learning goal) may lead to different types of cohesiveness (social cohesiveness and task cohesiveness), which, in turn, possibly will have different effects on various aspects of team outcomes.

Goal Orientation Research

In contrast to goal setting studies that have their roots in organizational psychology, goal orientation research originally comes from educational literature that suggests that individuals hold either a learning (mastery) or performance orientation toward tasks (Dweck, 1986). At the individual level, as discussed previously in Chapter One, a learning orientation is characterized by a desire to master a task, while a performance orientation reflects a desire to demonstrate high ability and to receive positive evaluations (Ames, 1992; Dweck, 1986; Dweck & Leggett, 1988; VandeWalle

& Cummings, 1997). The applicability of both orientations is actually multilevel in organizations. Gully and Phillips (2005) posited that at the individual level, these two orientations can reflect both dispositions and states. At the group level, these two orientations can be manifested in group norms and climates. Finally, at the organizational level, they are also evidenced in climate and organizational culture, which can be driven by leaders and shared perceptions and other contextual stimuli.

A growing body of work exists on learning and performance goal orientations. On the one hand, researchers have found that learning and performance goal orientations are two distinct constructs (e.g., Button, Mathieu & Zajac, 1996; Porter et al., 2004; VandeWalle, 1997). Therefore, a person can actually be high on both, low on both, or high on one and low on the other at the same time. Research evidence also suggests that learning and performance goals will create different frameworks within which individuals interpret and react to events such as performance feedback and saliency of different performance aspects (Dweck, 1989; Dweck & Leggett, 1988; VandeWalle, Cron & Slocum, 2001). On the other hand, though both learning and performance goals can promote active, effective striving on challenging tasks, there are research findings showing that performance goals may create a context that is less favorable to this when confronting challenging tasks (Dweck, 1989). Research has shown that individuals with a learning orientation tend to pursue an *adaptive response pattern* that is characterized by persistence in the face of failure, finding appropriate strategies in carrying out the task, and are more likely to take on difficult tasks and challenging goals. Performance orientation, alternatively, is associated with a *maladaptive response pattern*. It is

characterized by greater propensity to withdraw from tasks, particularly in the face of failure. This maladaptive response pattern also shows less interest in challenging tasks even when success is likely (e.g., Bell & Kozlowski, 2002; Dweck & Leggett, 1988).

Nonetheless, research in goal orientation has been inconsistent regarding whether the orientations are theorized to be traits or situationally manipulable states (Phillips & Gully, 1997). For example, Dweck's theoretical work strongly suggests that goal orientation is a relatively stable dispositional trait. However, Dweck (1986, 1989) also noticed that many of the goal orientation studies have manipulated the values of learning versus performance goal by manipulating the situation in which behavior occurs. Despite being a stable dispositional trait, goal orientation can actually be influenced by many contextual factors such as rewards, feedback, and information available. While believing goal orientation is a dispositional trait, some researchers measured the perceived aspects of the situation in which behavior occurs rather then really gauging individuals' personal beliefs (e.g., Ames & Archer, 1988). Moreover, Button, Mathieu and Zajac (1996) suggested that some researchers (e.g., Duda & Nicholls, 1992) may have unintentionally and probably unknowingly confounded the personal and situational aspects of goal orientation by modifying a dispositional measure of goal orientation for different settings.

The Relationships between Goal Orientation and Team Goals

It is well recognized that goal orientation is an essentially different construct than goals. However, there is increasing confusion in the literature between goal orientation

and goal-setting. There are a couple of reasons for the increased confusion between the two streams of research. First, the inconsistency with which researchers have theorized and manipulated goal orientation may have contributed to the confusion. Second, the confusion can also be the result of the fact that one research camp rarely takes into account findings by the other (Seijts et al., 2004). The connections between these seemingly similar yet independent streams of research in the organizational sciences have probably prompted Farr, Hofmann and Ringenbach's (1993) suggestion that goal orientation should be incorporated into research on goal-setting. Until recently, this sort of work has been slow to surface except for a few recent studies that attempted to make an effort (e.g., Seijts et al., 2004).

Recently, researchers have started to explore the effects of team goal orientation (e.g., Bunderson & Sutcliffe, 2003). Similar to goal orientations at the individual level, team learning orientation is operationalized as the extent to which a team is oriented toward improving and acquiring knowledge, skills and abilities as well as mastering novel or uncertain environments. Team performance orientation, on the other hand, is operationalized as the extent to which a team is focused on demonstrating high performance and avoiding failure as a team. Gully and Phillips (2005) have characterized goal orientation above the individual level as a climate variable, indicating the degree to which members of an organizational unit believe that they should focus on learning or performance perspectives of the task. In line with this team climate variable conceptualization, Bunderson and Sutcliffe (2003) investigated the effect of team goal orientation on management team performance and found that team learning orientation

also had positive effects on one measure of team effectiveness in their study, specifically the profitability. Porter (2005), taking a slightly different approach in measuring team goal orientation, found that the mean level of team members' learning and performance orientation had important effects on team processes (i.e., backing up behavior) and effectiveness outcomes (i.e., team commitment and team efficacy). Moreover, team performance orientation was also found to have relationships with team effectiveness outcomes even though the relationship was only clarified when also considering task performance. Specifically, Porter (2005) found team performance orientation had a positive effect on team viability when task performance was high and a negative effect on team efficacy when task performance was low. In sum, the growing stream of empirical research has demonstrated the predictive validity of goal orientation as a team composition variable. In addition, this line of research demonstrates potential implications of goal orientation at team or higher organizational levels.

Clearly recognizing the differences between two streams of research will help clarify the confusion in the literature. Seijts et al. (2004) examined the effects of goal orientation and the assignment of a specific high goal within a single research design. They investigated whether a person's trait goal orientation affects subsequent performance when a specific versus an abstract goal is set. They found that a person's trait goal orientation predicted subsequent performance only when a vague goal was set. On the other hand, when either a specific challenging learning or a performance goal was present, the effect of trait goal orientation would be attenuated.

It is logical to suggest that the team environment would provide many sources of situational influence that would not be consistent with one another on their effects on the team's processes and outcomes. Although goal orientation and goals are being recognized as two non-interchangeable concepts, they can still co-exist in a team setting and interactively affect team processes and outcomes. Despite Seijts et al.'s (2004) study that found one can actually be attenuated by the other, no research, at least to the best of my knowledge, has investigated the situations of the coexistence of both (i.e., goal and goal orientation) and their subsequent interactive effects in team settings. While it has been found that one may attenuate the other at the individual level, the interactive effects at higher organizational levels should provide more insights and clarification of these two different concepts.

The Relationships between Goal Orientation and Team Cohesion

Before going into the relationship between goal orientation and team cohesiveness, there are some links in the literature that need to be made in order to properly introduce the associations between the two constructs. First, the idea of cohesiveness is congruent with the notion of *social integration*: the degree to which group members are psychologically linked or attracted toward interacting in pursuit of a common objective (O'Reilly, Chatman & Caldwell, 1991). Katz and Kahn (1978) argued that integration of a social system results from a number of causes but is, for the most part, directly a function of affective factors. That is, within a group, individuals' personal satisfaction with other members and motivation to sustain those relationships

are important indications of integration. Therefore, similar to the cohesiveness construct, social integration can also be thought of as a multifaceted phenomenon that reflects attraction to the group, satisfaction with the group experience or other members, and social interacting in pursuing the common goal.

Second, Harrison, Price, and Bell (1998) asserted that the idea that differences among group members have a negative impact on group functioning is the primary thesis in the relational demography literature as well as the backbone of a variety of theories in social psychology and organizational behavior. The main element of group functioning that Harrison, Price and Bell had in mind in their study of the impact of demographic and attitudinal diversity on group social integration was actually concentrated on group cohesiveness, the primary affective dimension of social integration. Results of their study indicated that attitudinal differences were more important and had steadily stronger consequences for groups (Harrison, Price & Bell, 1998).

Consequently, the relationship between team goal orientation and team cohesiveness can thus be depicted as the relationship between nondemographic composition characteristics and team processes. The composition of the team has long been hypothesized to influence team processes and outputs. Although most team composition research has focused on the effects of demographic characteristics, the importance of the nondemographic factors is still emphasized and investigated by researchers (e.g., Barrick et al., 1998; Campion, Medsker & Higgs, 1993). Barrick et al. (1998) took a step further to examine the effects of individual-member traits in investigating the evidence of associations between such composition variables and team

process and effectiveness measures. The results of Barrick et al.'s study support the validity of using personal characteristics to predict team effectiveness. Moreover, their results also suggested that social cohesion partially mediates the relationship between team viability and some member traits (e.g., extraversion and emotional stability).

Finally, extrapolating from the research findings that suggest individuals with learning orientation tend to pursue an adaptive response pattern while individuals with performance orientation are inclined to have a maladaptive response pattern (e.g., Bell & Kozlowski, 2002; Dweck & Leggett, 1988), it is logical to expect the association between specific orientation and cohesiveness development. For example, in the face of difficulty, team members with a learning orientation will be more likely to provide assistance to others in the team in order to successfully carry out the task while team members with a performance orientation will probably withdraw before extending assistance to other members when seeing the possibility of failure.

Leader's Goal Orientation in Teams

Perhaps no other topic in the area of management has received as much interest or inquiry as the subject of leadership. Although this field has nearly a century worth of research investigations, many of us still find ourselves fascinated with the mystery of trying to make out what this obscure concept involves. One of the most researched models of leadership in the 20th century: Fiedler's Least Preferred Coworker (LPC) model (1964), is often called the first contingency perspective on leadership (Neider & Schriesheim, 2002). The model's main premise is that two factors interact to predict a

leader's effectiveness: One, the leader's characteristics (mostly defined by the leader's motivational orientation: task orientation and relationship orientation); and the other, the leader's level of certainty or control over the situation. The situation includes the work team's support for the leader, the clarity of the goal and strategy for the leader, and the authority present in the position of the leader. The model predicts that in situations where the leader has high control, the team's performance will be better if the leader is task-oriented rather than relationship-oriented. In situations where the leader has moderate control, the team's performance will be superior if the leader is relationship focused rather than task-oriented. When the leader has very little control and there is a crisis, even though the team performance is not at its highest, the team benefits more by having task-oriented than a relationship-oriented one.

Fiedler's model does not claim that it is a comprehensive model but it does examine leadership from an input and output perspective. Specifically, it is an empirically based paradigm that considers how the leader and team's interface results in organizational outcomes. However, the contingency model does not address the process or the interaction dynamics that transform the input variables and yield outputs. It primarily deals more straightforwardly with inputs and outputs. That is, the contingency model deals with team inputs such as characteristics of the leader or the team members and characteristics of the task. It also includes several individual and team outcomes such as performance and satisfaction. Finally, it is advocated that research on the contingency model that explores the processes that occur that transform inputs to outputs is indeed in order (Ayman, 2002).

Although leadership is often conceptualized as an important input factor in organizational effectiveness, it can also reasonably be seen as an important factor in the team process. In organizations, it is not uncommon to see work teams be formally assigned a team leader given the need for control of higher organizational structure. The formally assigned leader can sometimes come into being after the team has been created. This could occur because of the promotion of a former leader or job rotation of the previous person in charge, which is a common scenario in some government agencies or the military. Therefore, in such situations leadership can actually be considered as a process factor in the temporal process of team development. In addition, the leader is more and more seen as a coordinator or facilitator (Manz & Sims, 1989). The leader thus plays a central role in coordinating individuals comprising the team to meet the coordination demands. For example, the basic rationale of Kozlowski et al.'s (1996) theoretical framework of team effectiveness (Figure 3) is that team processes mediate the linkage between input factors and team effectiveness (i.e., output factors).

The *enabling process* depicted in the framework can actually be conceptualized as a variant of the leader's influences in examining team effectiveness.

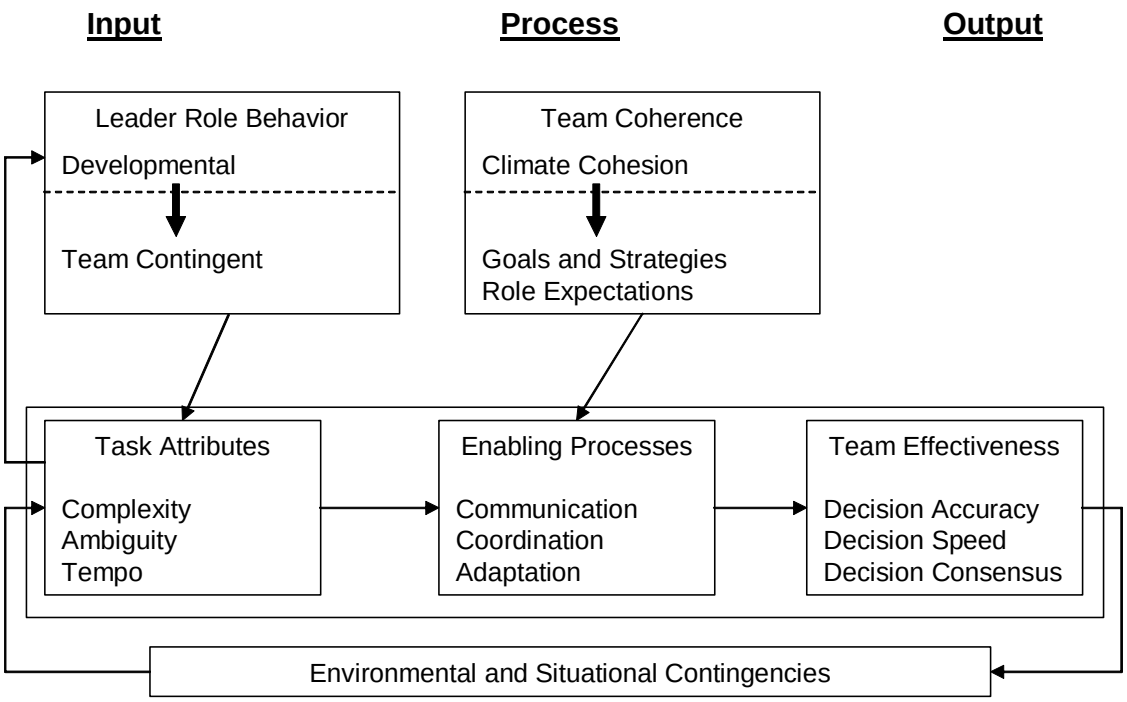

Figure 3. The Effects of Leader Role Behavior on Team Processes and Effectiveness (Kozlowski, et al., 1996)

Learning organizations and adaptive workers have become more and more important for organizational performance in globalized economies. In order to survive or to sustain a competitive advantage, organizations must stay flexible, and continually adjust to shifting environments (D'Aveni, 1994). The movement toward total quality management in the U.S. industry in the early 1990s is indicative of how modern organizations are responding to the demand for constant learning and improvement (Gully & Phillips, 2005, in press). As March (1991) indicated, organizational survival in a highly competitive and changing world is dependent on the simultaneous carrying out

of both adaptability and reliable performance. Adaptability and reliable performance can be, in fact, the result of two different orientations: learning and performance.[2]

From a system's perspective, the concepts of goal orientation and leadership are embedded in modern organizational function and process. Gully and Phillips (2005, in press) have made a case for how and why learning and performance orientations are important to organizational performance in a competitive and changing world. Given the embeddedness of teams in modern organizations (Ilgen, 1999) and the fact that teams are more and more considered as the building blocks of modern organizations (Sundstrom, De Meuse & Futrell, 1990), trait goal orientation of these team leaders can be critical to our understanding of team effectiveness, and consequently organizational effectiveness.

Teams embedded in organizations are exposed to several salient environmental stimuli that are important determinants of motivation and behavior. The work of classic human relation theories has asserted that leadership is a basis for the social and motivational processes affecting individual behavior (e.g., Likert, 1967; McGregor, 1960). Leadership of the immediate supervisor is likely to be salient since he or she probably will sort out what is happening at higher organizational levels. Therefore, the leadership process may be a key factor in the interpretations of the environments that provide the basis for subordinates' attitudes toward the task or other team members in the team developmental progress.

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[2]Gully and Phillips (2005, in press) believe that most organizations need both profound and incremental changes for survival and optimum performance, and in turn, the profound and incremental changes are the result of learning and performance orientations, respectively.

Teams embedded in organizations are exposed to several salient environmental stimuli that are important determinants of motivation and behavior. The work of classic human relation theories has asserted that leadership is a basis for the social and motivational processes affecting individual behavior (e.g., Likert, 1967; McGregor, 1960). Leadership of the immediate supervisor is likely to be salient since he or she probably will sort out what is happening at higher or organizational levels. Therefore, the leadership process may be a key in the interpretations of the environments that provide the basis for subordinates' attitudes toward the task or other team members in the team developmental progress.

Different trait goal orientations will lead to different interpretations, hence, have different consequent behaviors (Ames, 1992; Dweck, 1986; Dweck & Leggett, 1988; VandeWalle & Cummings, 1997). The leader's individual trait goal orientations in a team context, therefore, will certainly play a role in the process of team development and the team's task contingent behavior, particularly in the early *forming* stage of team development. In the *forming* stage of team development, team members attempt to discover the nature and boundaries of the task and to discern what behaviors are acceptable in the team context (Tuckman, 1965). The framework of this study places the role of leader's trait goal orientation in the context of team goal setting and its interacting process (as depicted in Figures 1 and 2). The specific behaviors derived from trait goal orientations can also be considered as the role behavior of the formally designated leadership. Although the primary impact of leadership is expected to occur during early team formation (Kozlowski et al., 1996), it nevertheless can be

conceptualized as an interacting process that extends beyond the input phase in a input-process-output model. The outcome of this interaction between leader trait goal orientation and team goals will then provide the foundation for the development of another important construct in team context, cohesiveness.

Conclusions on Goal Orientation

Many potential influences goal orientation may have upon the team process and team outcomes remain veiled. Moreover, the increasing confusion in the literature between goal orientation and goals has probably led to the neglect of such potential effects of goal orientation in team goal research. In team contexts, leader trait goal orientation may be a critical factor if one considers how teams are formed and the assignment of leadership positions.

One conclusion we can make from related findings of the literature is probably that the effects of goal orientation tend to be attenuated if there is a specific and challenging goal at the individual level. However, because most previous studies in this stream of research seem to focus on the relationship between individual goal orientation and individual goal, more interactive relationships at higher organizational levels remain to be explored. The role of leadership should not be ignored, particularly the effects of leader's trait goal orientation in team settings. Under consideration is the extent to which the leader, as compared to the existing team goal, is the more influential on team processes and team outcomes.

Discussions of the interactive relationship between the team leader's trait goal orientation and team goal challenge us to consider the typical view we hold of goals at the team level. The review of the literature above suggests that no research in the existing literature has explored the effects of the interactive relationship between leader's trait goal orientation and team goal and such interaction upon team process and team outcomes. However, theoretically and pragmatically, it appears that the examination of leader' trait goal orientation in team settings may open up a whole new direction for future investigations of enabling and moderating influences of goal orientation.

The Present Research and Theoretical Model Overview

Figures 1 and 2 present an initial attempt to develop a theoretical model of the interaction effects between team goals and team leader's trait goal orientation, team cohesiveness development, and consequently, the effects of such cohesiveness upon team effectiveness outcomes. Specific emphasis is placed on the moderating role of leader's trait goal orientation in team goal contexts and the mediating role of cohesiveness in the input-process-output framework of team effectiveness. As previously discussed, despite the well supported positive relationship between team goal and team performance, the lack of a theoretical framework and systematic research on the potential moderating role of leader's trait goal orientation has left an important void in the effort to integrate goal and goal orientation literature. Moreover, why and how

goals lead to positive outcomes has not been sufficiently answered in the literature. The model proposed here addresses both issues.

The first focus of the proposed study is on the interacting process between goal orientation and team goal that should occur because of the separation of management and mission assignment. At the outset, team members' individual goal orientation is believed to be considerably attenuated by the team goal as discussed in the previous review (Seijts et al., 2004). However, the leader is expected to interpret the environment and manage the team according to his or her own personal characteristics (i.e., learning or performance orientation). Therefore, the moderating effects that leader trait goal orientation may have on the relationship between team goal and team cohesiveness development and eventually the team effectiveness will be investigated

The second focus is on the mediating role of cohesiveness in the input-process-output framework of team effectiveness. Recently, in Kozlowski et al.'s (1996) dynamic model of leadership, team cohesiveness is depicted as what links the input factors (e.g., leader role behaviors) to the output factors (i.e., team effectiveness) in teams. Briefly, in their model, team cohesion is viewed as the consensus on factors such as agreement on the quality of relations among team members, attraction to interpersonal aspects of the team, and to team tasks and objectives, which in turn, has provided some theoretical support that teams with goals could be more cohesive than teams without goals. Although Kozlowski et al. (1996) have called attention to the importance of the cohesiveness construct in team contexts and its relations to different aspects of team effectiveness, they failed to differentiate different types of cohesiveness in their model

and investigate the factors of their formation. Team goals and the leader's trait goal orientation are two potential factors in forming two different types of cohesiveness in team context since specific goal and trait goal orientation has been found to elicit specific behaviors (e.g., Gully & Phillips, 2005, in press; Seijts et al., 2004). This study proposes that the distinctive behaviors resulted from different team goals or leader trait goal orientations may very well be the foundation of the development of different types of cohesiveness.

In addition, Zaccaro and Lowe (1988) found that there were nonequivalent effects of task-based and interpersonal cohesion on task performance. On the one hand, task-based cohesiveness is found to increase group performance, most probably by increasing the amount of effort and motivation that team members apply to task completion (Hackman & Morris, 1975). On the other hand, interpersonal cohesiveness increased both task commitment and interaction frequency among members, thus made possible the *process loss* by directing members' effort to activities not directly related to the success of the task at hand (e.g., exchange of information not critical to task performance). Therefore, the relationship between different types of cohesiveness should also be examined in order to further contribute to the literature of cohesiveness.

The following chapters develop several hypotheses from the theoretical model as it systematically includes both goal setting and goal orientation constructs in team context in an input-process-output framework of team effectiveness. It is hoped that the model will serve as a first step in guiding researchers seeking to both differentiate and

integrate goal setting and goal orientation research in teams, as well as their interactive effects upon team cohesiveness and eventually, on team effectiveness.

CHAPTER III

HYPOTHESES

Both qualitative and quantitative meta-analytical studies have found that group goals indeed have a positive relationship with group performance (Locke & Latham, 1990; Martocchio & Frink, 1994; O'Leary-Kelly). At the individual level, for goals to be effective, they have to be specific and difficult. However, a common scenario of goal setting studies at the organizational level is that conflicts over goals may arise. On the contrary, conflicts over goals typically are not of concern at the individual level of goal setting research since in most such studies there is only one goal assigned or manipulated regardless of whether the studies were conducted in lab settings or field settings. To examine the effects of goals at levels higher than the individual level in organizations, it is important that a specific goal is given in order to reduce the possibility of conflicts over goals. Conflicts over goals will make it difficult if not impossible to predict goal effects because no clear relationship between goals and organizational outcomes can be identified.

Goal difficulty, although another important factor in goal setting research at the individual level, is not as feverishly pursued or emphasized in group contexts in the literature. Locke and collogues (Locke & Latham, 1990; Locke & Somers, 1987) suggested that goal difficulty is related to group effort and persistence; however, there are many other stimuli that may also affect effort and persistence. O'Leary-Kelly, Martocchio & Frink (1994) provided some explanation for why goal difficulty has been

more of an ambiguous issue in group contexts. As a result, it seems reasonable to suggest goal specificity alone can have certain effects upon group performance in contrast to the criticality of both specificity and difficulty to individual performance**.**

Effects of Goals on Team Effectiveness

To the extent that the goals are viewed as one of the consensus factors in team settings, Kozlowski et al.'s (1996) dynamic model of leadership suggested that teams with goals will have higher cohesion than teams without goals. As discussed earlier, Seijts et al. (2004) recently investigated the relationship between goal setting and goal orientation and found that the effect of individual trait goal orientation would be weakened if either a specific challenging learning or performance goal was set. Therefore, it is logical to expect that a team can also be induced to be learning or performance oriented by giving a specific challenging learning or performance team goal. Team learning and performance orientations manifest themselves through the behaviors, motivations, and perceptions of individual members. Similarly, Button, Mathieu and Zajac (1996) treated goal orientation as a "somewhat stable composition variable that may be influenced by situational characteristics" (p. 28). Briefly, researchers seem to suggest that team goal orientation can probably be influenced by the situational factors just as individual state goal orientation can actually be induced. In sum, the literature suggests that learning or performance oriented behaviors can be expected from team members by having specific learning or performance goals. In turn,

these learning or performance oriented behaviors in teams should have a positive relation with teams' learning or performance outcomes.

Moreover, Yamaguchi (2001), in a study investigating the importance of group context in children's cooperative learning groups, found that group members under the performance condition exhibited more dominance and negative behaviors whereas group members under the learning condition exhibited more emergent leadership and positive behavior. It was also found that under the performance condition, group members were not as effective in cooperatively completing the math task because of negative communication, member dissatisfaction, and isolation. In contrast, under the learning condition group members were more effective, demonstrating positive communication, group cohesion, and a shared responsibility in completing the math task. While Yamaguchi's study was not specifically designed to examine the resulting behavior of specific goals or goal orientation, its findings are somewhat contradicting with the findings of existing goal setting research suggesting the association of goals with positive outcomes at the team level (Locke & Latham, 1990; O'Leary-Kelly, Martocchio & Frink, 1994; Wegge, 2000). Therefore, the following hypotheses are suggested:

- Hypothesis 1: There will be a positive main effect of a team performance goal on team task performance.
- Hypothesis 2: There will be a positive main effect of a team learning goal on a) team learning performance, b) team satisfaction, and c) team viability.

The Role of Team Cohesion

By and large, researchers have not yet confirmed the exact factor structure of team cohesion in the work setting. However, recent studies have suggested that group level task and social cohesion constructs are more appropriate for research that intends to investigate the relationship between group cohesion and group performance because a) a limited number of extant studies with non-sport teams generally found good support for the task-social distinction (Zaccaro & Lowe, 1988) and b) group-level task and social cohesion are at the same level of analysis as group performance (Gully, Devine & Whitney, 1995).

While there has been considerable debate over the definition and structure of cohesion, little attention has been given to the outcome variable in the cohesion-performance relationship. In other words, the definition and measurement of team performance varies from study to study and no one has seriously considered establishing a consistent definition for team performance. Traditionally, team performance is operationalized as some form of team productivity such as task scores, decision quality, number of wins, and problem–solving scores. Regardless of how previous researchers have quantified or qualified team productivity, such conceptualization of team performance ignores the fact that team performance, like team cohesion, can also be a multidimensional construct that has an affective component to it. Therefore, a more inclusive definition of team output is more appropriate than simply the team product quantity or quality. The affective component of team output is important because it will have an effect on how team members coordinate their effort and attention toward the

team task or other members of the same team. For example, conflicts within a team may more easily surface if members were unsatisfied with their team experience and thus cause more *process loss.*

For that reason, a broader definition that can more fully account for team output is in order. Team effectiveness, as suggested by various researchers in the literature, is usually broadly defined by performance, member satisfaction, and team viability (Guzzo & Dickson, 1996; Hackman, 1987; Sundstrom, De Meuse & Futrell, 1990). They are a more appropriate representative of team output than simply the performance construct. The present study takes on the multidimensional team effectiveness construct as well. One objective is to examine the effects of task and social cohesion on three components of team effectiveness as defined here: team performance, member satisfaction, and team viability. Previous researchers that examined the cohesion –performance relationship, using the unidimensional definition of group performance, only found a strong relationship between task cohesion and group performance (Mullen & Copper, 1994). That was probably because group performance was often operationalized as the only "output" dimension of the multidimensional team effectiveness model in previous studies.

Widmeyer and Ducharme (1997) suggested that team goals can also have some effects on team cohesion. Goals facilitate performance by directing attention and action (Locke & Latham, 1984). Therefore, team goals can simply provide a focus that will promote intra-group communication and facilitate overall members' commitment and satisfaction, all of which have been shown to enhance team cohesion in sport

(Widmeyer, Brawley & Carron, 1985). Mitchell and Silver (1990) examined the effect of providing individual goals, group goal, or both individual and group goals working on an interdependent task and found that providing only individual goals resulted in worse group performance than the other two goal conditions. More importantly, it was found that groups provided only individual goals were never considered themselves to be a team. In sum, groups that received a group goal were actually more cohesive than groups that did not.

Also, note that researchers of the multidimensional view of group cohesion suggest that there are in reality different types of group cohesion where each type is a function of the dominant reasons why members join and maintain membership in a group (Gross & Martin, 1952; Hackman, 1987; Tziner, 1982). In addition, Tziner (1982) suggested that different types of cohesion can have effects on different team processes or team outcomes. As a matter of fact, Zaccaro and Lowe (1988) even found that task cohesion facilitates performance while increases in interpersonal cohesion could result in more frequent interactions among group members. Therefore, given the fact that cohesion has been empirically found to be related to team performance whereas theoretically having a team goal can also enhance team cohesion as discussed earlier, the following hypotheses are proposed:

- Hypothesis 3: Task cohesion will mediate the effects of a team performance goal on team task performance.
- Hypothesis 4: Task cohesion will mediate the effects of a team learning goal on team learning performance.

- Hypothesis 5: Social cohesion will mediate the effects of a team learning goal on a) team learning performance, b) team satisfaction, and c) team viability.

Interactive Effects of Team Goal and Leader's Trait Goal Orientation on Team Cohesion and Team Effectiveness

It should be noted that most previous studies on team goals failed to differentiate the role of team goals and leader's trait goal orientation in team contexts. This is probably the result of viewing the leader as just another member of the team. However, in real work organizations, the person in the leadership position usually tends to have more influence. The results of small group laboratory studies in the 1950s indicated that one's position in the social network structure of task-performing groups was a powerful predictor of perceptions of leadership (Shaw, 1964). Although these studies are limited in their generalizability, certain network structures resulted in more than 90 percent of the participants listing the same name when asked, "Did your group have a leader? If so, who?" (Leavitt, 1951). These leaders were found to have occupied central positions in the network. Social network studies in a variety of settings have consistently found that centrality is related to influence and power (Brass, 1992). As Yukl (1994) argued, "influence is the essence of leadership," then we should expect that more influence on the team process can be emanated from the leader role than any other regular member.

Many extant theories and models of leadership seek to explain the influence of hierarchical superior upon the satisfaction of subordinates. Although those theories and models may disagree with one another in important respects, one thing they have in

common is a belief that hierarchical leadership is always important (Kerr & Jermier, 1978). However, the influence of leadership is actually "nonroutine" influence. That is, leadership does not reside in the routine activities of the organizational network. Instead, it occurs, in response to, or in anticipation of, nonroutine organizational events. This defining element was suggested by Katz and Kahn (1978), who considered "the essence of organizational leadership to be the influence increment over and above mechanical compliance with the routine directives of the organization" (p. 528). Similarly, agency theory (Eisenhardt, 1989) is, perhaps, the most widely recognized theory that suggests such separation between influences coming from the organization and the leader role.

In contrast, George (1990) has provided some theoretical justification for investigating personality, affect, and behavior at the group level. Based on Schneider's (1987) attraction-selection-attrition (ASA) framework, she talked about how universal personality orientation (i.e., positive or negative *affective tone*: similar or homogeneous affective reactions within a group) in teams develops. In the present study, it is believed that the leader's personal attributes (e.g., trait goal orientation) will have a certain degree of influence in team contexts. That is, the congruence or incongruence of a leader's trait goal orientation with the team goal should have positive effects on both the team's processes and outcomes.

It is reasonable to expect people with a performance goal orientation would pay less attention to the non-task relevant activities because they are largely concerned about the task performance and how they appear to others. As a result, when people of performance orientation congregate, they are less likely to pay attention to activities that

are not directly related to the focal task. That is, they would be more likely to try to ensure positive performance outcomes by not spending time on tasks that do not contribute directly to performance outcomes such as getting to know one another in the group. Alternatively, learning oriented people are more likely to have positive communication and share their responsibility in completing the task (Yamaguchi, 2001). Therefore, when people of learning orientation get together, they will probably spend time and attention resources on tasks that do not necessarily directly contribute to the performance outcome. As a result, the early task performance, particularly on complex or novel tasks, could be hampered because of efforts that are directed towards tasks that do not directly and immediately contribute to the focal task performance.

Following Yamaguchi's (2001) concurring findings with goal orientation researchers' assertions regarding response patterns and the multidimensional view of team cohesion, it is proposed here that leader's trait goal orientation and team goals will interactively determine the team cohesion. More specifically, there will be an interactive effect between a team performance goal and a leader's trait goal orientation on task cohesion such that:

- Hypothesis 6: The effect of a team performance goal on task cohesion is more positive when the leader is high of performance orientation than when the leader is low of performance orientation.

There will be also an interactive effect between a team learning goal and a leader's trait goal orientation on social cohesion such that:

- Hypothesis 7a: The effect of a team learning goal on social cohesion is more positive when the leader is high of learning orientation than when the leader is low of learning orientation.
- Hypothesis 7b: The effect of a team learning goal on task cohesion is positive when the leader is high of learning orientation and there is no effect if the leader is low of learning orientation.

Table 1 provides a list of all of the study's hypotheses. As can be seen in the table, Hypotheses 1, 2, concern the direct effects of team goals on team effectiveness. Hypothesis 3, 4, and 5 particularly aim to investigate the mediating role of cohesion in the relationship between team goals and team effectiveness in this study's input-process-output framework. Finally, Hypothesis 6, 7a, and 7b concern the interactive relationship between team goals and leader's trait goal orientation and their interactive effects on the two-dimension cohesion in teams.

Table 1
List of Study Hypotheses

Hypothesis 1:	There will be a positive main effect of a team performance goal on team task performance.
Hypothesis 2:	There will be a positive main effect of a team learning goal on a) team learning performance, b) team satisfaction, and c) team viability.
Hypothesis 3:	Task cohesion will mediate the effects of a team performance goal on team task performance.
Hypothesis 4:	Task cohesion will mediate the effects of a team learning goal on team learning performance.
Hypothesis 5:	Social cohesion will mediate the effects of a team learning goal on a) team learning performance, b) team satisfaction, and c) team viability.
Hypothesis 6:	There will be an interactive effect between a team performance goal and a leader's trait goal orientation on team cohesion such that: The effect of a team performance goal on task cohesion is more positive when the leader is high of performance orientation than when the leader is low of performance orientation.
Hypothesis 7:	There will be an interactive effect between a team learning goal and a leader's trait goal orientation on team cohesion such that: a) The effect of a team learning goal on task cohesion is more positive when the leader is high of learning orientation than when the leader is low of learning orientation. b) The effect of a team learning goal on social cohesion is more positive when the leader is high of learning orientation than when the leader is low of learning orientation.

CHAPTER IV

METHOD

Research Design

The study used teams comprised of five voluntary participants. In each team, one person was randomly designated as the leader. The purpose was to investigate the relationship of the team leader's trait goal orientations, team goals, team cohesion, and team effectiveness as depicted in Figures 1 and 2.

The investigation used an experimental group-control group: randomized participants (Kerlinger & Lee, 2000) to empirically test the relationships. Campbell and Stanley (1963) call this design the post-test only control group design. One variable was manipulated between teams: the goal assigned (learning versus performance goal). Therefore, three types of teams were used—teams with a learning goal, teams with a performance goal, and teams with no goal.

Power Analysis

Of the three general strategies for determining the size of the population effects that a research project is trying to detect (Cohen & Cohen, 1983), the simplest way is to use conventional definitions of small, medium, and large effect sizes. Cohen (1992) suggested that "one possible reason for the continued neglect of statistical power analysis in the behavioral science is the inaccessibility of or difficulty with the standard

material." In order to discontinue the continuing ignorance of the importance of power analysis in research, Cohen (1992) provided a short rule-of-thumb treatment of necessary sample size illustrating how statistical power analysis can take advantage of the relationship among the four variables involved in statistical inference: sample size (*N*), significance criterion (α), population effect size (ES), and statistical power. In this study, it was determined that a medium effect of team goals and the leader's trait goal orientation on team cohesion and ultimately the team effectiveness would be important to detect, especially for team-level analyses. As a result, the medium effect size (i.e., r = .30) was used. Based on Cohen's (1992) guidelines, it was determined that 68 teams would provide a power of .80 at the .10 level of significance for test of significance of product-moment r. Consequently, a sample of no less than 68 teams (340 participants) was required for this study.

The Task

Research participants worked on an interdependent team task. Among five members in each team, one was randomly designated the leader role. The task was a modified version of the Distributed Dynamic Decision-making (DDD) military simulation task developed and used as part of the US Air Force training (Hollenbeck et al., 2002). DDD is a computer simulation of military command-and-control context in which participants work interdependently on networked computers to protect a restricted airspace from enemy targets. Working as a team, the participants are responsible for detecting, identifying, and attacking any enemy targets that enter restricted areas by

using vehicles such as tanks, helicopters, jets and radar planes. Meanwhile, participants also need to be careful not to destroy friendly targets that may also enter the restricted areas. Each participant has an individual workstation. While all participants including the leader are within visual proximity of each other (with the leader's workstation a bit farther away from four other member stations), they cannot see others' monitor screens clearly. Depending on the location of the participant's particular portion of the restricted airspace and the locations of his or her vehicles, participants may only see part of the whole scenario during the task. It is very likely that one participant may see many enemy targets in a specific restricted airspace while the other participants can only see a little, or no indication at all of the enemy targets' presence. On the other hand, the leader of the team is always able to see what is happening across the whole restricted airspace. However, the leader still needs one of the team members to transfer the target identities in order to tell whether a specific target on the screen is an enemy or a friendly force. As such, the task requires both high levels of interdependence among the four team members and timely guidance of the team leader.

The primary method of communication in this simulation is verbal. All participants except the leader are responsible for detecting, identifying, and attacking, if necessary, the enemy targets by using the vehicles such as radar planes, jets, helicopters, and tanks (with attacking power level of 0, 1, 3, and 5, respectively) that are available to team members. Two types of scores are given at the end of each task: a defensive score and an offensive score. For each enemy target in the restricted space, the team loses its defensive score by either 1 point per second or 2 points per second depending on where

the enemy target is located in the restricted airspace. However, for any friendly target accidentally attacked, the team loses 25 offensive points, while successfully attacking an enemy target in the restricted areas is awarded 5 offensive points. Therefore, DDD teams are actually making tactical decisions under temporal urgency because the longer the enemy targets remain in the restricted airspace, the more points the team loses. The defensive score takes into account how well the team keeps the restricted airspace free of enemy targets by destroying them as soon as they enter the restricted airspace. Given the importance of, yet limited amount of time in the task, the defensive score also provides relatively more information regarding time spent making mistakes (i.e., disabling friendly targets, having difficulty launching vehicles, attacking enemy targets in restricted airspace with a vehicle of lower power level or with a vehicle that is in fact out of ammunition). In order to obtain a high defensive score, team members must effectively coordinate their inputs and actions to protect the restricted airspace under the leader's supervision and guidance.

The DDD game designed for this study is a functional task with unpredictable waves of incoming targets. In a DDD game of functional structure, each team member has four same vehicles (i.e., either be radar planes, jets, helicopters, or tanks). That is, one has four radar planes, one has four jets, one has four helicopters, and one has four tanks. The waves of targets come from four corners of the screen in a random pattern. Members of the team have to collectively protect the restricted areas and help the member who is encountering a wave of targets under the leader's supervision in order to obtain a high defensive score. Note that whoever gets assigned four radar planes is not

capable of destroying any enemy targets in their own portions of the screen because the radar planes do not have any attacking power. Therefore, the situation makes it critical for all members to coordinate their resources and effort to obtain a high defensive score as a team.

Participants' Duties

Targets are shown as radar representations of vehicles moving through the geographic space monitored by the team. The targets are configured in such that they vary in terms of a) being friendly or unfriendly, b) air-based or ground based, and c) the power level that indicates the minimum power an attacking vehicle must have in order to successfully destroy the target (i.e., 1, 3, or 5). In order to obtain a high defensive score on the task, participants have to prevent the enemy targets from coming into the restricted areas. The targets may come from various directions, and they may come either as a wave, or individually in a sporadic pattern. A target has to be manually identified by the participants in order to tell whether it is a friendly or enemy force. Once identified, the target type and its power level are shown in a rectangular box (A for air-based and G for ground-based; power levels: 0, 1, 3, and 5). If a target with a power level of 0 is shown, it means that it is a friendly target and should be left alone no matter where it is on the screen. If accidentally destroyed, 25 points are deducted from the offensive score. Participants also encounter four types of U-targets (unknown targets) in the actual DDD game. These U-targets, each with one specific and consistent power level (either 0, 1, 3, or 5), show like other targets when they are first detected on the

monitor screen. However, they do not show their power level, thus they cannot be known as friendly or enemy forces even after being manually identified by the participants. In fact, it requires the collective effort of the team members to find out the power level of each U-target.

By using the vehicles they own in the task (i.e., radar planes, jets, helicopters, or tanks), team members identify and attack enemy targets if they have entered the restricted areas. Before the targets are identified, they are shown as a question mark in a diamond-shape box with a serial number when they enter the participant's detection ring (the detection ring can be either of the home base or of one of the vehicles). The identification number is unique to each target. To be able to identify a target, the target must be within the range of the participant's identification ring (can be either the identification ring of the home base or of one of the vehicles). Finally, to be able to destroy an enemy target, the target must be within the vehicle's attack ring and the vehicle must have sufficient power. The target also has to be inside the restricted areas or 25 points are lost if they are accidentally destroyed. Each participant has a home base on the screen with only detection and identification rings. The home base cannot be used to attack targets; however, it can be used for launching vehicles and reloading and refueling vehicles. The leader, while having neither vehicle nor home base to operate on the computer screen, serves a critical facilitating and guiding role since this individual has a comprehensive view of the situation. Notwithstanding, in order to tell the targets' identity, the leader still needs the team members to transfer the identity information of the targets.

To effectively share the information of the targets, participants have to manually click on the "transfer info" button from the target's drag-down menu. There are also specific procedures that participants have to follow in order to successfully destroy enemy targets. For example, to be able to attack again after accomplishing one successful attack, the vehicle has to be manually sent back to its home base to reload. However, vehicles are automatically sent back to home base if they eventually run out of fuel.

Sample and Procedure

The final sample consisted of 73 teams (365 participants). Participants were undergraduate students in a business school of a Southwestern university. Participation in the experiment was on a voluntary basis, but extra course credit was awarded for students' participation. In addition, at the end of the semester, a cash prize of one hundred dollars for three teams was drawn (e.g., three, one-hundred dollar prizes were awarded). Two teams were selected for a cash prize based on their team outcome. For teams with a performance goal, the winning team was chosen based on the defensive score obtained at the end of the DDD game. For teams with a learning goal, the winning team was chosen based on the team's scores on a test that is given to all teams before the experiment is finally terminated. The test is scored by correct answers provided in identifying the unknown targets as well as in identifying suitable strategies in defending the restricted airspace after the DDD game. For teams with no goal, the winning team was chosen based on a random draw. The cash prize was advertised when recruiting

students in order to encourage students' participation. The cash prize and its method for distribution at the end of the semester were also explained during the experiment in order to enhance the effect of goal manipulation. Teams were randomly put into performance goal, learning goal, and no goal categories.

Of the 365 participants in 73 teams, 73 were team leaders, and 292 were team members. 95 percent of the participants were in the age group of 19-24 years old; 54 percent were female; 84 percent were White/Caucasian, 7 percent were Hispanic, 6 percent were Asian, 2 percent were African American, and 1 percent were Native American. 92 percent of participants indicated their computer skills fell within the range of "somewhat skilled" to "very skilled." When asked how often they play video games, 37 percent of them indicated that they fall in the range of "sometimes" to "very often."

Participants were randomly seated in Stations 0, 1, 2, 3, and 4 upon their entry into the laboratory. The person who was randomly seated in Station 0 was designated as the leader of the team by the experimenter's public announcement. Participants were then instructed to sign a consent form and answer a survey regarding their demographic information and trait goal orientation. Participants then received declarative and procedural training on the DDD game. The training lasted about 70 minutes and it was during the training that participants became familiar with the team task including the task screen, the scoring, the vehicles, and the targets.

After the training and after the leader was escorted out of the laboratory for further instruction on leader functions in the DDD tasks, each team was randomly assigned either a learning goal, performance goal, or no goal (Appendix A—goal

discussion). The leader was also purposely kept away during the goal assignment time so that the leader trait goal orientation would not be biased. After the team was given a goal, team members in Station 1, 2, 3, and 4 then had a break of 10 minutes in the laboratory. This 10-minute break was given in order to allow team members some time to socialize with one another. While the team members were encouraged to be introduced to one another during the 10 minute-break, the leader was given more information (Appendix B) on how to best utilize and coordinate resources available within the team to more effectively perform the DDD tasks. Moreover, information about the U-targets was given to the leader during this time and time was allotted for the leader to anticipate how to handle these targets when seen in the actual game. The information was given to the leader by the experimenter on a one-on-one basis to ensure that the information was well understood by the leader.

After they had their 10-minute break and while the leader was out, team members were then instructed to answer questions in the Team Member Questionnaire regarding their team satisfaction, team viability, social cohesion, and task cohesion. After all members finished their survey questions and before the leader re-entered the laboratory, the members were reminded again about their team goal. Once the leader returned to the laboratory and before the DDD game was started, the experimenter briefly explained to the team about the U-targets they would encounter in the actual game. They were also told to use the information they had learned during the training to deal with these U-targets appropriately.

During the game, the leader utilized the training received and the specific information he or she gained outside the laboratory as a leader to manage the team. However, some novelties in the actual DDD game that were not seen during the training were the Unknown targets (U-targets). Four different types of U-targets emerged among other targets. It required coordinated effort among members in order to find out exactly what each U-target was (i.e., the power level) and to deal with each of these U-targets correctly as soon as possible. Otherwise, points would be lost by letting the unknown enemy targets stay in the restricted areas without being destroyed.

After the actual DDD game, all participants including the team leader answered questions on the power level of each U-target and on perceptions of team goal orientation. Members of the team and the leader all answered goal orientation questions with the team as the referent. Team members also answered survey questions on their goal commitment, team satisfaction, team viability, social-, and task-cohesion. At the end of the survey questions, members of the team were asked whether there were a formal and an informal leader in the team during the experiment and the identity of such leader (i.e., Station 0, 1, 2, 3, or 4). A test was also given to all participants after the survey regarding their knowledge of the game and some possible strategies to be adopted in order to better defend the restricted areas. Finally, all participants were debriefed and thanked before being dismissed from the laboratory.

Measures

Measures of team inputs, team processes, and team effectiveness outcomes were collected. All measures were collected at the individual level and aggregated to the team level. The actual surveys for the team leader and team members are presented in Appendix C and Appendix D, respectively. The following sections describe each of the measures that were used.

*Demographic Information***.** Demographic characteristics such as age, gender, GPA, ethnicity, how often each participant played video games, and to what extent each participant was familiar with using a computer as well the extent to which each individual participant in a team knew the other members in the same team when they first came to the laboratory (based on a five point scale ranging form a small extent to a large extent) were collected. Though I did not expect any demographic characteristic-specific effect to occur, the data were collected in case there was a need for such analysis.

Trait goal orientation. Learning orientation and performance orientation were measured at the individual level with a sixteen-item scale developed by Button, Mathieu and Zajac (1996). Coefficient alpha reported in Button, Mathieu and Zajac s (1996) study for the eight-item performance goal orientation was .73 while the coefficient alpha for the eight-item learning goal orientation was .79. Measures of the leader's trait goal orientation were collected to examine the interactive effect of the leader's trait goal orientation and team goal on team cohesion. Team leaders were asked to respond to these items on a five-point Likert-type scale (1 = strongly disagree to 5 = strongly

agree). In this study, coefficient alpha for the eight-item performance goal orientation was .69, while the coefficient alpha for the eight-item learning goal orientation was .76.

Team satisfaction. Team satisfaction was measured by the following three items from Gladstein (1984): "I am satisfied with my present teammates," "I am pleased with the way my teammates and I work together," and "I am very satisfied with working in this team." Team members were asked to respond to these items on a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). Coefficient alpha reported in Gladstein's (1984) was .90. Coefficient alpha for this team satisfaction scale was also .90 in this study.

Team viability. Barrick et al. (1998) developed a scale of team viability from two scales that have been used to assess members' willingness to continue functioning as a team. Their scale has 12 items that measure the degree to which the team was likely to function together as a team in the future. Coefficient alpha of the original 12 items reported in Barrick et al.'s (1998) was .82. Examples of items included "This team should not continue to function as a team (reverse coded)" and "This team accomplished what it set out to do." Team members were asked to respond to these statements on a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). Coefficient alpha for the team viability scale in this study was .87.

Social cohesion. Perceptions of social cohesion were measured with eleven items adopted directly from Zaccaro and Lowe's (1988) work on the relationships between multidimensional cohesiveness and performance. They originally adapted these items from Anderson (1968). Out of the eleven items, ten items asked team members to rate

their team on a 5-point scale anchored as follows: cold-warm, unpleasant-pleasant, dislikable-likable, courteous-discourteous, undependable-dependable, friendly-unfriendly, bold-cautious, casual-deliberate, liberal-conservative, and cool (*nonchalant*)-serious. The eleventh question asked subjects to rate from 1 to 5 the degree to which they thought their team was a "close" team (5 being the closest). Higher scores indicated greater social cohesion. Zaccaro and Lowe (1988) did not report the coefficient alpha for this social cohesion scale in their study; however, the eleven-item scale was found to have a coefficient alpha of .64 in the current study.

Task cohesion. Perceptions of task cohesion were measured with six items adopted from Zaccaro and Lowe (1988). All items were reworded such that they were appropriate for the purpose of this study. Examples of items were, "It is personally important that this team succeeds" and "I am willing to put in a great deal of effort beyond what is normally expected in order to keep our defensive score high." Coefficient alpha for this team task cohesion scale was .80.

Team performance. Two types of team performance were measured: task performance and learning performance. First, the overall task performance measure took into account how well the team kept the restricted areas free of enemy targets by destroying them as soon as they entered the restricted areas. The defensive score at the end of each 30-minute game was thus a measure of their team task performance. Second, participants were given a test with thirty-seven questions after the DDD game. First half of the test (i.e., the first twenty-two questions) assessed subjects' procedural and declarative knowledge of the computer simulation. Most of the procedural and

declarative information was actually covered and given to the subjects during the training session. The second half of the test (i.e., the remaining fifteen questions) assessed the extent to which subjects could identify suitable strategies for defending the restricted areas in the computer simulation. The total correct answers provided in the whole test were the performance outcomes when measuring learning performance.

Manipulation checks. At the end of the experiment questionnaire (Appendix D), team members were asked a few items about whether there was a formal and/or informal leader in their team and what type of team goal was assigned. This was necessary to guarantee that participants were able to acknowledge the existence of a formally assigned leader and able to identify for the goals to accomplish during the experiment.

Analyses. Statistically this was a single level study because there was only one team leader per team. All individual team members' responses were aggregated to the team level after demonstrating agreement reliability and after demonstrating there was more between-team than within-team variance. Multiple, hierarchical, and hierarchical mediated/moderated regression analyses were used to test the team level hypotheses proposed in Chapter III.

CHAPTER V

RESULTS

I first performed principal-components analyses with varimax rotation of the items on two of the predicted variables (i.e., team satisfaction and team viability) and one mediator variable (i.e., task cohesion). The analysis of the team satisfaction scale yielded a one-factor solution, accounting for 83.6% of the variance, with all three items loading above .82. The analysis of team viability scale yielded three factors with eigenvalues greater than one (eigenvalues = 5.0, 1.6, 1.2) with one factor accounting for a substantial portion (42%) of the variance and the other two factors accounting for 14% and 10%, respectively. Consistent with the conceptualization of team viability, all items loaded on the first factor (.52 or higher). No conceptual reasoning could be developed for the other two factors. Based on these results, it was concluded that the team viability items resulted in a one-factor solution. The analysis of the social cohesion scale also yielded three factors with eigenvalues greater than one (eigenvalues = 4.4, 1.5, 1.2) with one factor accounting for a substantial portion (40%) of the variance and the other two factors accounting for 14% and 11%, respectively. Similarly, it was also concluded that the social cohesion items resulted in a one-factor solution. The task cohesion scale was also found to have a one-factor solution and accounted for 50% of the variance. The scores obtained on the game and the scores obtained on the test administered at the end of the experiment measured team task and learning performance, respectively; higher scores indicated better team performance.

I also performed a confirmatory factor analysis to examine the structure of the items adapted form various studies because the items were put together in one study for the first time. These items were adapted to measure the mediator variables (i.e., task cohesion and social cohesion) and the team effectiveness outcomes (i.e., team satisfaction and team viability). A confirmative factor analysis was appropriate given their multiple origins. Particularly, one purpose of the confirmative factor analysis was to provide evidence that task cohesion and social cohesion measured in this study were in fact two distinct constructs. Both a four-factor model (χ^2 = 1410.38; df = 458, p <.01; GFI = .743; RMSEA = .0931) and a three-factor model (χ^2 = 1889.72; df = 462, p <.01; GFI = .637; RMSEA = .128) confirmatory factor analyses were conducted. χ^2 probability of the difference between two models was obtained in the Excel worksheet via the CHIDIST (i.e., one-tailed probability of chi-squared distribution) function. The result indicated that the difference between two models was significant ($\Delta\chi^2$ = 479.34; Δdf = 4; p < .01). The four-factor model was a better model and these four factors explained about 51 percent of variance in responses to the items.

Table 2 provides the descriptive statistics and correlations of all the variables. The slightly lower reliability of performance orientation (.69) is worth mentioning. The performance orientation scale used in this study was adapted from Button, Mathieu and Zajac (1996). When the scale was first developed and introduced, it was reported to have a coefficient alpha of .73. Its validity has been empirically tested and generally well supported in various goal orientation studies. However, the original scale used a 7-point scale response options while this study used a 5-point scale for consistency purpose.

Table 2

Means, Standard Deviations, and Zero-Order Correlations of Study Variable

Variable	*M*	*SD*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Defensive score	31333.95	3802.80	--									
(2) Team Satisfaction	4.01	.39	.10	(.90)								
(3) Team Viability	3.57	.32	.24*	.77**	(.87)							
(4) DDD Test Score	29.13	2.11	.28*	.18	.30**	--						
(5) Social Cohesion	3.42	.21	.03	.47**	.48**	.05	(.64)					
(6) Task Cohesion	3.69	.29	.07	.26*	.55**	.17	.21*	(.80)				
(7) Leader LO	3.96	.43	-.02	.20†	.11	.14	.15	.13	(.76)			
(8) Leader PO	3.64	.47	-.13	.03	-.08	-.12	.07	-.15	-.06	(.69)		
(9) DC L goal	--	--	-.09	.24*	.31**	.22†	.30**	.06	.13	.00	--	
(10) DC P goal			-.03	-.19	-.22†	-.15	-.27*	.10	.00	.06	-.51**	--

Note: N=73. Scale reliabilities can be found on the diagonal, in parentheses.

DC = Dummy coded.

† p < .10; * p < .05; ** p < .01 (2-tailed)

According to Cortina (1993), all else being equal, coefficient alpha increases as item and scale variance increases. The slight drop of coefficient alpha (from .73 in Button, Mathieu & Zajac's to .69 in this study) (1996) of performance orientation scale could very possibly be attributed, but not limited, to the 5-point scale response option used (i.e., restricted variance).

Finally, turning to defensive score and DDD test score in Table 2, these are two objective measures of team task and learning performance. The defensive score was reported as the total defensive score attained at the end of the computer simulation (because there was no meaningful mean value), while the DDD test score was reported as a mean score. Reporting a team's DDD test score as a mean is based on the functional relationship between the team and individuals within the team, where the team score is a summation of team members' scores regardless of the variance among team members (Chan, 1998).

A number of measures collected in this study were sought to examine team level constructs even though most of the study's measures were collected at the individual level of analysis. In order to examine the extent to which there was support for aggregating individual level measures into team level constructs, ICC(1), ICC(2), ANOVA significance tests, and $r_{wg(j)}$ values were calculated and the results are provided in Table 3.

Table 3
Aggregation Indices of Study's Team Level Constructs

Scale	ICC(1)	ICC(2)	F/p-value	$r_{wg(j)}$
Team Satisfaction	.13	.37	1.60/.005	.89
Team Viability	.17	.45	1.81/.001	.95
Task Cohesion	.09	.29	1.40/.03	.95
Social Cohesion	.18	.47	1.89/.000	.95

ICC(1) is the proportion of variance in ratings as a result of team membership. It helps detect non-independence, which means within-unit variance is substantially smaller than between-unit variance. In other words, ICC(1) can be used as a measure to determine the extent to which there is sufficient support of lower level data aggregation for the purpose of higher level analysis. James (1982) interprets ICC(1) as an index of interrater reliability and also recommends using it as a criterion for aggregating. Smaller variability in responses across members within a unit generally indicates higher agreement. ICC(2) is the reliability of unit means. It indicates whether unit means can be used to reliably differentiate between units in terms of their ratings. ANOVA significance tests (F/p-value in Table 3) provide the evidence that there was more variability in responses to the scales between teams compared to within teams. Finally, $r_{wg(j)}$ is used to assess the extent to which there is high inter-member agreement (within teams) on a multi-item scale (with j parallel items).

As can be seen in Table 3, there was generally adequate support for aggregating most of the study's measures to the team level in order to examine the team level constructs. Overall, ICC(1) provides the most direct support of whether or not individual perceptions within teams were similar enough to be aggregated into team level perceptions for the purpose of this study. Bliese (2000) reported that he typically found

ICC(1) values reported between .05 and .20. All ICC(1) values reported in Table 3 actually fall right in the range between .09 and .18. Researchers who use ICC(1) to justify aggregation typically assert that aggregation is warranted if the F-test is statistically significant. A statistically significant F-test suggests that the between-unit variance of a measure is significantly greater than the within-group variance of the measure (Klein et al., 2000). As shown in Table 3, all the ANOVA tests for the scales lent support to the fact that there was indeed more between team variance than within team variance.

In addition, ICC(1) also indirectly suggests that the study's manipulation (i.e., random assignment of four subjects into a team for a three-hour experiment) was successful (i.e., team members shared the belief that they were indeed a team).

The $r_{wg(j)}$ values also provide strong support for aggregation of the measures to the team level. A common rule of thumb is that aggregation is justifiable if $r_{wg(j)}$ is .70 or higher. As can be seen in Table 3, all $r_{wg(j)}$ values of measures collected in this study are above .89, thus justifying aggregation to the team level. Unfortunately, the ICC(2) values for most of the scales fall into the *poor* category (i.e., <.50) according to common practice (Klein et al., 2000). However, the low ICC(2) values obtained in this study could be largely a function of sampling similar types of teams (i.e., teams of four undergraduate students enrolled in a management course) from a single university, which resulted in less reliable differences between teams and thus lower ICC(2) values (Bliese, 2000; James, Demaree & Wolf, 1984). In general, evidence presented in Table 3

appears to provide adequate support to aggregate individual level measures into team level.

Manipulation Checks

A number of analyses were conducted to assess the manipulations used. These analyses were necessary in order to demonstrate that the experimental manipulations were at least relatively successful. Analyses of the manipulation check items revealed that 90.5% of team members were aware of the fact that there was a formally assigned team leadership position. Moreover, those who responded acknowledging the presence of a formal leader also correctly indicated the leader's assigned station in the experiment (i.e., DM0). As for the effects of goal assignment to teams, two-third of teams were explicitly assigned a team goal during the experiment. 89% of the team members in the same two-thirds could correctly state the team goal (i.e., learning goal or performance goal). The manipulation check item of goal assignment manipulation asked team members "…did the experimenter tell you that your goal should be focusing on the learning or performance perspective of the game?" This goal assignment manipulation was actually relatively effective especially when compared to the control groups of the experiment. Control groups were not assigned any goal during the experiment. However, when team members in control groups were asked similar questions regarding team goals, their answers varied greatly with only 59% correctly specifying that there was not really a team goal assigned.

Tests of Hypotheses

To test the study's mediation and moderation hypotheses, hierarchical regression analyses were conducted. Following Cohen et al. (2003), leader's personal trait goal orientation, task cohesion, and social cohesion were centered (i.e., by subtracting the mean from each score). The interaction terms were also based on these centered scores. The results are discussed with one-tailed significance tests. Power analysis for this study indicated that at least 68 teams would be needed for a power of .80 at the .10 level of significance for test of significance of product-moment *r*. There were 73 teams in the final sample. Tables 4 through 10 show the regression results for all dependent variables (i.e., task performance, team learning performance, team satisfaction, and team viability) and two mediator variables (i.e., task cohesion and social cohesion). In order to succinctly present the regression results in the tables, interactions between team goals and leader goal orientation that are not predicted are also included. In the sections below I first discuss the tests of the main effect hypotheses (Hypotheses 1, 2a, 2b, and 2c) before turning next to the moderation tests and mediation tests.

Effects of Team Goals on Team Effectiveness Outcomes

Turning first to the hypothesized effects of team goals on team effectiveness outcomes, results of the main effect hypotheses of this study can be found by examining Tables 4, 5, 6, 7, and 8. As shown in Step 1 of Table 4, Hypothesis 1 of the positive relation between team performance goal and team task performance was not supported (β = -.10, n.s.). Team performance goal did not have a statistically significant effect on

team task performance as hypothesized and the relationship was not consistent with the direction as predicted by Hypothesis 1.

Table 4
Hierarchical Regression Analyses: Predicting Team Task Performance (i.e., Defensive scores; N = 73)

Step and Variables			
Model 1	β	ΔR^2	R^2
Step 1. Experimental Goal Condition			
Dummy Coded Learning Goal (DC L Goal)	-.14	.02	.02
Dummy Coded Performance Goal (DC P Goal)	-.10		
Step 2. Leader Goal Orientation		.02	.03
Learning Goal Orientation (LGO)	-.01		
Performance Goal Orientation (PGO)	-.12		
Step 3. DC L Goal × LGO	.07	.15*	.18
DC P Goal × LGO	.41**		
DC L Goal × PGO	-.36*		
DC P Goal × PGO	-.01		
Model 2	β	ΔR^2	R^2
Controlling for Task Cohesion	.07	.01	.01
Step 1. DC L Goal	-.15	.02	.02
DC P Goal	-.12		
Step 2. Leader Goal Orientation		.01	.04
Learning Goal Orientation (LGO)	-.01		
Performance Goal Orientation (PGO)	-.12		
Step 3. DC L Goal × LGO	.08	.15*	.18
DC P Goal × LGO	.41**		
DC L Goal × PGO	-.36*		
DC P Goal × PGO	-.01		

Note: All IVs are centered.
* $p < .05$; ** $p < .01$; one-tailed.

Table 5
Hierarchical Regression Analyses: Predicting Learning Performance (i.e., Test Scores; N = 73) with Task Cohesion as Mediator

Step and Variables			
Model 1	β	ΔR^2	R^2
Step 1. Experimental Goal Condition			
Dummy Coded Learning Goal (DC L Goal)	.19	.05	.05
Dummy Coded Performance Goal (DC P Goal)	-.05		
Step 2. Leader Goal Orientation		.03	.07
Learning Goal Orientation (LGO)	.11		
Performance Goal Orientation (PGO)	-.11		
Step 3. DC L Goal × LGO	-.14	.08	.15
DC P Goal × LGO	.21		
DC L Goal × PGO	-.27		
DC P Goal × PGO	-.14		
Model 2	β	ΔR^2	R^2
Controlling for Task Cohesion	.17	.03	.03
Step 1. DC L Goal	.17	.05	.08
DC P Goal	-.08		
Step 2. Leader Goal Orientation		.02	.09
Learning Goal Orientation (LGO)	.09		
Performance Goal Orientation (PGO)	-.08		
Step 3. DC L Goal × LGO	-.21	.08	.18
DC P Goal × LGO	.16		
DC L Goal × PGO	-.24		
DC P Goal × PGO	-.18		

Note: All IVs are centered.
* $p < .05$; ** $p < .01$; one-tailed.

Table 6
Hierarchical Regression Analyses: Predicting Learning Performance (i.e., Test Scores; N = 73) with Social Cohesion as Mediator

Step and Variables			
Model 1	β	ΔR^2	R^2
Step 1. Experimental Goal Condition			
Dummy Coded Learning Goal (DC L Goal)	.19	.05	.05
Dummy Coded Performance Goal (DC P Goal)	-.05		
Step 2. Leader Goal Orientation		.02	.07
Learning Goal Orientation (LGO)	.11		
Performance Goal Orientation (PGO)	-.11		
Step 3. DC L Goal × LGO	-.13	.08	.15
DC P Goal × LGO	.21		
DC L Goal × PGO	-.27		
DC P Goal × PGO	-.14		
Model 2	β	ΔR^2	R^2
Controlling for Social Cohesion	.05	.00	.00
Step 1. DC L Goal	.20	.05	.05
DC P Goal	-.05		
Step 2. Leader Goal Orientation		.03	.08
Learning Goal Orientation (LGO)	.11		
Performance Goal Orientation (PGO)	-.10		
Step 3. DC L Goal × LGO	-.13	.08	.15
DC P Goal × LGO	.21		
DC L Goal × PGO	-.27		
DC P Goal × PGO	-.13		

Note: All IVs are centered.
* $p < .05$; ** $p < .01$; one-tailed.

Table 7
Hierarchical Regression Analyses: Predicting Team Satisfaction (N = 73)

Step and Variables			
Model 1	β	ΔR^2	R^2
Step 1. Experimental Goal Condition			
Dummy Coded Learning Goal (DC L Goal)	.19	.06	.06
Dummy Coded Performance Goal (DC P Goal)	-.10		
Step 2. Leader Goal Orientation		.04	.10
Learning Goal Orientation (LGO)	.19		
Performance Goal Orientation (PGO)	.05		
Step 3. DC L Goal × LGO	.29	.07	.17
DC P Goal × LGO	.33*		
DC L Goal × PGO	-.02		
DC P Goal × PGO	.11		
Model 2	β	ΔR^2	R^2
Controlling for Social Cohesion	.47**	.22**	.22
Step 1. DC L Goal	.09	.01	.23
DC P Goal	-.03		
Step 2. Leader Goal Orientation		.02	.25
Learning Goal Orientation (LGO)	.13		
Performance Goal Orientation (PGO)	.02		
Step 3. DC L Goal × LGO	.28*	.07	.32
DC P Goal × LGO	.36*		
DC L Goal × PGO	-.05		
DC P Goal × PGO	-.03		

Note: All IVs are centered.
* $p < .05$; ** $p < .01$; one-tailed.

Table 8
Hierarchical Regression Analyses: Predicting Team Viability (N = 73)

Step and Variables			
Model 1	β	ΔR^2	R^2
Step 1. Experimental Goal Condition			
Dummy Coded Learning Goal (DC L Goal)	.27*	.10*	.10
Dummy Coded Performance Goal (DC P Goal)	-.08		
Step 2. Leader Goal Orientation		.01	.11
Learning Goal Orientation (LGO)	.07		
Performance Goal Orientation (PGO)	-.07		
Step 3. DC L Goal × LGO	.46**	.20**	.31
DC P Goal × LGO	.51**		
DC L Goal × PGO	-.14		
DC P Goal × PGO	.17		
Model 2	β	ΔR^2	R^2
Controlling for Social Cohesion	.48**	.23**	.23
Step 1. DC L Goal	.17	.03	.26
DC P Goal	-.02		
Step 2. Leader Goal Orientation		.01	.27
Learning Goal Orientation (LGO)	.02		
Performance Goal Orientation (PGO)	-.11		
Step 3. DC L Goal × LGO	.46**	.18**	.44
DC P Goal × LGO	.54**		
DC L Goal × PGO	-.17		
DC P Goal × PGO	.03		

Note: All IVs are centered.
* $p < .05$; ** $p < .01$; one-tailed.

Table 9
Hierarchical Regression Analyses: Predicting Team Task Cohesion (N = 73)

Step and Variables	β	ΔR^2	R^2
Step 1. Experimental Goal Condition			
Dummy Coded Learning Goal (DC L Goal)	.15	.03	.03
Dummy Coded Performance Goal (DC P Goal)	.18		
Step 2. Leader Goal Orientation		.04	.06
Learning Goal Orientation (LGO)	.11		
Performance Goal Orientation (PGO)	-.15		
Step 3. DC L Goal × LGO	.39*	.14*	.20
DC P Goal × LGO	.27		
DC L Goal × PGO	-.13		
DC P Goal × PGO	.21		

Note: All IVs are centered.
* $p < .05$; ** $p < .01$; one-tailed.

Table 10
Hierarchical Regression Analyses: Predicting Team Social Cohesion (N = 73)

Step and Variables	β	ΔR^2	R^2
Step 1. Experimental Goal Condition			
Dummy Coded Learning Goal (DC L Goal)	.23*	.11**	.11
Dummy Coded Performance Goal (DC P Goal)	-.16		
Step 2. Leader Goal Orientation		.02	.13
Learning Goal Orientation (LGO)	.13		
Performance Goal Orientation (PGO)	.08		
Step 3. DC L Goal × LGO	.01	.06	.19
DC P Goal × LGO	-.07		
DC L Goal × PGO	.08		
DC P Goal × PGO	.33*		

Note: All IVs are centered.
* $p < .05$; ** $p < .01$; one-tailed.

Step 1 of Table 5, 6, 7 and 8 shows the results associated with the tests of Hypotheses 2a, 2b, and 2c. Unfortunately, Step 1 of both Table 5, 6 and 7 shows that there was no statistically significant relationship between team learning goal and team learning performance (β = .19, n.s.) and team satisfaction (β = .19, n.s.), respectively. Therefore, Hypotheses 2a and 2b were marginally supported. On the other hand, team learning goal did not have a positive main effect on team learning performance and team satisfaction. In support of Hypotheses 2c, Step 1 in Table 8 shows that there was a statistically significant relationship between team learning goal and team viability (β = .27, $p < .05$), suggesting that a team learning goal positively influences team viability.

Mediation of Team Goals by Team Cohesion

Hypotheses 3, 4, 5a, 5b, and 5c together predicted that team task cohesion and social cohesion would mediate the effects of team goals on team effectiveness outcomes.

Specifically, Hypotheses 3 and 4 predicted that task cohesion would mediate the effects of team performance goal on team task performance (i.e., defensive score) and the effects of team learning goal on team learning performance (i.e., DDD test score). Hypothesis 5a, 5b, and 5c predicted that social cohesion would mediate the effects of team learning goal on a) team learning performance, b) team satisfaction, and c) team viability, respectively. Testing mediation is a multistep process (Baron & Kenny, 1986). Mediation is supported when the independent variable being tested significantly relates to the mediator. Further, the independent variable being tested significantly relates to the dependent variable in the absence of the mediator. Finally, the influence of the independent variable on the dependent variable must disappear or reduce in size upon the addition of the mediator to the model.

Most of the hypothesized main effects of independent variables on the dependent variables were not found except for the positive main effect of a team learning goal on team viability (Hypothesis 2c). Nevertheless, the relationships between the independent variables (team learning and performance goals) and mediator variables (task cohesion and social cohesion) were investigated. Tables 9 and 10 give the test of the first requisite condition, the existence of relationship between independent variable and the mediator, for mediation. Here, the relationship between the independent variables (i.e., team goals) and the mediating variables (i.e., task cohesion and social cohesion) are indicated by the regression results of Step 1 in Tables 9 and 10. As shown in the regression results, it was found that there was no relationship between team goals (either learning or performance goals) and task cohesion. However, team learning goal was found to be significantly

related to team social cohesion ($\beta = .23$, $p < .05$). Thus, Hypotheses 3, 4, and 5a were not supported. Nonetheless, social cohesion did mediate the effects of team learning goal on team viability. As a result, Hypothesis 5c was supported.

In order not to omit any possible mediation effects, an alternative mediation approach was used. It is an equivalent approach that calculates the indirect effect by multiplying two regression coefficients (Sobel, 1982). The two coefficients (unstandardized) are obtained from two regression models. The first one includes only the independent variable in the regression model, with the mediator as the dependent variable. The second one is with both the independent variable and the mediator in the model as the predictors of the ultimate outcome, the dependent variable. From the regression model with only the independent variable, it is important to obtain the unstandardized regression coefficient for the association between independent variable and mediator, a, and standard error, s_a. After that, the unstandardized regression coefficient for the association between the mediator and the dependent variable from the model with independent variable and mediator, b, and standard error, s_b must be obtained. To test the significance of the mediated effect, I used the formula: z-value = $a*b/\text{SQRT}(b^2*s_a^2 + a^2*s_b^2)$. As can be seen in Table 11, Hypotheses 3, 4, and 5a, were still not supported based on the results of Sobel tests. However, in addition to Hypothesis 5c, Hypothesis 5b was also supported given the less stringent method used to investigate the mediation effects. The results of the Sobel test suggested that social cohesion mediates the relationship between a team learning goal and team satisfaction. In fact, as shown in the bottom half of Table 7, although not statistically significant, the

team learning goal's effect dropped from .19 to .09 when social cohesion was entered into the regression model.

Table 11
Results of Sobel Tests for Hypothesized Mediation Effects

	DV	IV	Mediator	Test Statistic	p-value
Hypothesis 3	Task Performance	Performance Goal	Task Cohesion	.516	.606
Hypothesis 4	Learning Performance	Learning Goal	Task Cohesion	.451	.652
Hypothesis 5a	Learning Performance	Learning Goal	Social Cohesion	-.195	.846
Hypothesis 5b	Team Satisfaction	Learning Goal	Social Cohesion	2.211	.027
Hypothesis 5c	Team Viability	Learning Goal	Social Cohesion	2.195	.028

Moderating Effects of Leader's Trait Goal Orientation on Team Cohesion

Finally, I turn to the hypothesized moderating effects of leader's trait goal orientation on team cohesion. Tables 9 and 10 present the results of regressing task cohesion and social cohesion, respectively, on the independent variables (i.e., team learning and performance goals), moderators (i.e., leader's trait learning and performance goal orientation), and the interaction between team goals and leader trait goal orientation. In Step 1 of each of the regressions, both dummy coded team goals (i.e., team learning goal and team performance goal) were entered. In Step 2, leader trait goal orientation was entered. Finally in Step 3, two two-way interaction terms between team goal and leader trait goal orientation were entered.

Table 9 shows the regression results on team task cohesion. As can be seen in Table 9, Hypothesis 6 was not supported ($\beta = .21$, n.s.); team's performance goal and

leader's performance goal orientation did not have a statistically significant and positive interactive effect on team task cohesion.

Table 9 also presents the regression results for Hypothesis 7a. As can be seen in Step 3 in column 1, there was a statistically significant effect ($\beta = .39$, $p < .05$) of the interaction term between team learning goal and leader learning goal orientation on team task cohesion. There was a positive effect of a team learning goal on task cohesion when the team leader was also high on learning goal orientation. Figure 4 illustrates the interaction pattern between team learning goal and leader learning goal orientation, with the relationship between team goal and task cohesion plotted separately for teams with leaders of high learning orientation and leaders of low learning orientation. As predicted in Hypothesis 7a, among teams with a team learning goal, teams with a leader of high learning goal orientation became more task cohesive than teams with a leader of low learning goal orientation. Teams with high learning oriented leaders also became less task cohesive when in the no team goal condition (i.e., control group), which was not a formal prediction of Hypothesis 7a.

Table 10 shows the regression results for team social cohesion. As can be seen in Step 3 of column 1, there was no statistically significant interactive effect ($\beta = .01$ n.s.) of team learning goal and leader learning goal orientation on team social cohesion. Hypothesis 7b was therefore not supported.

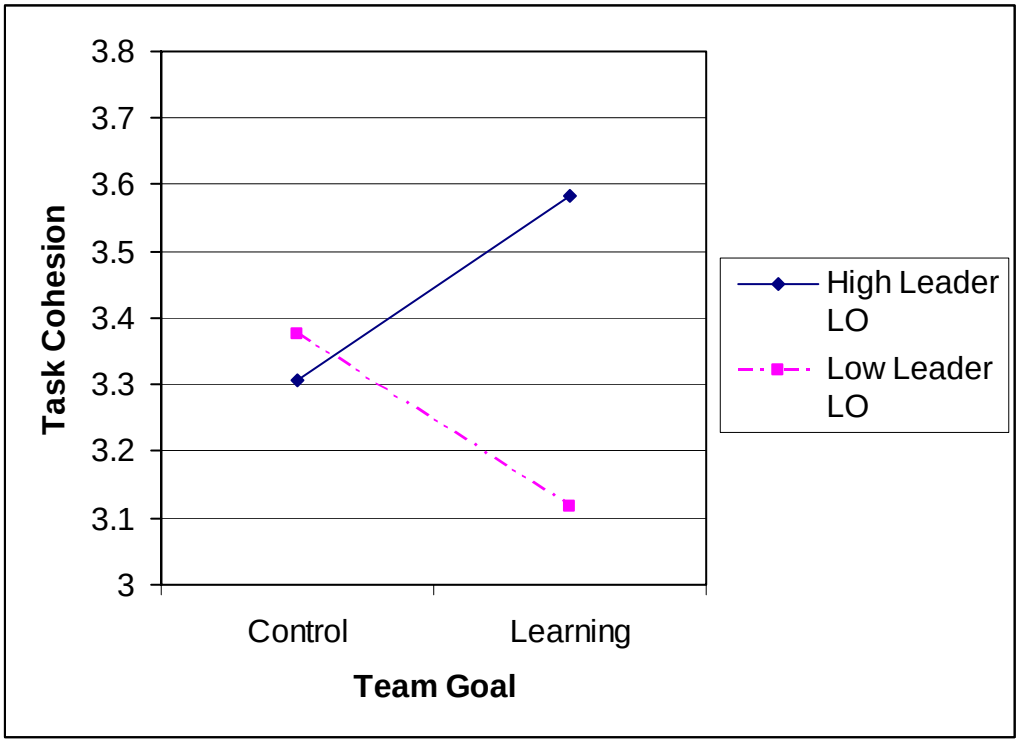

Figure 4. Interactive Effects of Learning Goal and Leader Learning Orientation on Task Cohesion

Summary of Effects Found for Study Hypotheses

In summary, one main effect, one mediating effect, and one moderating effect were found in this study. Table 12 lists the test results of study hypotheses. First, this study found that there was a positive main effect of team learning goal on team viability. Second, following Baron and Kenny's (1986) method for examining mediation, social cohesion was found to mediate the effects of a team learning goal on team viability. When the Sobel (1982) test was used in examining mediation, it was found that social cohesion, also, mediated the effects of team learning goal on team satisfaction. Finally,

the effects of a team learning goal on task cohesion were more positive when the leader was also high in learning orientation.

Table 12
List of Test Results of Study Hypotheses

Hypothesis 1:	There will be a positive main effect of a team performance goal on team task performance. (**NS**)
Hypothesis 2:	There will be a positive main effect of a team learning goal on a) team learning performance, (**NS**) b) team satisfaction, and (**NS**) c) team viability. (**S**)
Hypothesis 3:	Task cohesion will mediate the effects of a team performance goal on team task performance. (**NS**)
Hypothesis 4:	Task cohesion will mediate the effects of a team learning goal on team learning performance. (**NS**)
Hypothesis 5:	Social cohesion will mediate the effects of a team learning goal on a) team learning performance, (**NS**) b) team satisfaction, and (**NS**) c) team viability. (**S**)
Hypothesis 6:	There will be an interactive effect between a team performance goal and a leader's trait goal orientation on team cohesion such that: The effect of a team performance goal on task cohesion is more positive when the leader is high of performance orientation than when the leader is low of performance orientation. (N**S**)
Hypothesis 7:	There will be an interactive effect between a team learning goal and a leader's trait goal orientation on team cohesion such that: a) The effect of a team learning goal on task cohesion is more positive when the leader is high of learning orientation than when the leader is low of learning orientation. (**S**) b) The effect of a team learning goal on social cohesion is more positive when the leader is high of learning orientation than when the leader is low of learning orientation. (**NS**)

Note: **S**: Supported, **NS**: Not Supported

Supplemental Analyses

Many of the non-supported hypotheses raise questions as to the effectiveness of the experimental manipulation, namely, whether the assigned team goal was salient enough to make a difference between the experimental group and the control group given the fact that this study used a post-test only control group design. On the one hand, the computer simulation task was by nature performance-oriented itself, thus possibly making it difficult for the team performance goal to introduce any significant effects when compared to the control group. On the other hand, effects of the team learning goal would probably be diminished as well because of the computer simulation task's inherent performance emphasis. However, as previously mentioned, the manipulation check essentially revealed that the manipulation was successful (89% of the participants acknowledged there was an assigned team goal and correctly stated the nature of the goal, i.e., either a learning or a performance goal). As a result, it was possible that despite the fact that most of the study's participants could recognize and clearly specify their team goal, the effects of goal manipulation were diminished because of lacking goal commitment.

Included in the questionnaire of the experiment were also items adapted from Klein et al. (2001) for measuring goal commitment. Team members were asked to respond to five statements on a five-point scale as to what extent they agreed with the statements regarding the assigned team goal. Examples of these items include "It is hard to take this goal seriously" and "I am strongly committed to pursuing this goal." The reliability of the scale reported in Klein et al.'s (2001) study for their sample of assigned

goal subgroup was .78 at the individual level. The $r_{wg(j)}$ for these five items was .82, whereas ICC(1) was .10, ICC(2) was .32, and an ANOVA significance test was 1.46/.019 (F/p-value). In general, there was adequate support for aggregating these measures to the team level (i.e., mean goal commitment score of all team members).

Because an objective of this supplemental analysis was to find out why there were not sufficient main effects (i.e., goal effects), a decision was made to analyze the data again with goal commitment as a moderator in the relationships between team goals and team cohesion as well as the relationships between team goals and team effectiveness outcomes. This decision was based on the speculation that the participants' insufficient goal commitment might be the cause for the outcomes hitherto. The results of the supplementary analyses, as shown in Table 13, were indeed, to some extent, better than what were found in the original analyses. In total there were three main effects and three mediation effects supported. However, the moderation effect of leader's learning orientation in the relationships between team learning goal and task cohesion disappeared once goal commitment was entered into the model.

Table 13
List of Test Results of Study Hypotheses in Supplementary Analyses

Hypothesis 1:	There will be a positive main effect of a team performance goal on team task performance. (**NS**)
Hypothesis 2:	There will be a positive main effect of a team learning goal on a) team learning performance, (**S**) b) team satisfaction, and (**S)** c) team viability. (**S**)
Hypothesis 3:	Task cohesion will mediate the effects of a team performance goal on team task performance. (**NS**)
Hypothesis 4:	Task cohesion will mediate the effects of a team learning goal on team learning performance. (**S**)
Hypothesis 5:	Social cohesion will mediate the effects of a team learning goal on a) team learning performance, (**NS**) b) team satisfaction, and (**S**) c) team viability. (**S**)
Hypothesis 6:	There will be an interactive effect between a team performance goal and a leader's trait goal orientation on team cohesion such that: The effect of a team performance goal on task cohesion is more positive when the leader is high of performance orientation than when the leader is low of performance orientation. (**NS**)
Hypothesis 7:	There will be an interactive effect between a team learning goal and a leader's trait goal orientation on team cohesion such that: a) The effect of a team learning goal on task cohesion is more positive when the leader is high of learning orientation than when the leader is low of learning orientation. (**NS**) b) The effect of a team learning goal on social cohesion is more positive when the leader is high of learning orientation than when the leader is low of learning orientation. (**NS**)

Note: **S**: Supported, **NS**: Not Supported.

CHAPTER VI

CONCLUSIONS

This study sought to explore the moderating effects of a leader's trait goal orientation on the relationships between team goals and two-dimensions of team cohesion. The study also attempted to further explicate the relationships between team cohesion and team effectiveness outcomes by testing several hypotheses derived from a number of theoretical frameworks. Goal setting theory (Locke & Latham, 1984) in addition to Kozlowski et al.'s (1996) dynamic theory of leadership and team effectiveness provided the theoretical frameworks for examining the interactive effects between leader's trait goal orientation and team goals on team cohesion in teams. However, the nature of these two effects (i.e., goals and leader's trait goal orientation) was never examined jointly in an identical context in any study prior to this one.

Teams have become a facet of modern organizational life and, like individuals in organizations, these teams need to be developed as well as managed in order to benefit organizations. In the trend of self-managed teams in contemporary organizations, teams are often given specific goals and left to perform independently. Nevertheless, leadership is believed to be an important factor in facilitating and coordinating the functioning of teams, even in self-managing teams (Zaccaro, Rittman & Marks, 2001). Moreover, team effectiveness derives from several fundamental characteristics, and causes of team failure may very well reside in the team processes extending beyond individual

member's inability. These team processes are an important determinant of team performance, and often mediate the influences of most organizational variables.

Based mainly on the frameworks of goal-setting theory (Locke & Latham, 1984) and Kozlowski et al.'s (1996) dynamic theory, and team effectiveness (Hackman, 1987), I sought to explore how leaders' trait goal orientations interact with team goals in developing team cohesion and the mediating roles of team cohesion in linking these interactive effects and team effectiveness outcomes. The results of this study yield that a learning goal is positively related team viability and social cohesion mediates the effects of a learning goal on team viability. The effect of a team learning goal on task cohesion is more positive when the leader is high in learning orientation than when the leader is low in learning orientation.

However, further investigation of the interactive effects between team goals and leader's trait goal orientation finds that these interactive effects also directly affect some of the team effectiveness outcomes. For example, as shown in Figures 5 and 6, the interaction between a team learning goal and the leader's learning goal orientation positively influences team satisfaction ($\beta = .28$, $p < .05$) and team viability ($\beta = .46$, $p < .01$), respectively. Although the interactive effects are not mediated by social cohesion as the study hypothesized, they nevertheless show the significant effects that a team goal and the leader's trait goal orientation may jointly have upon the team effectiveness outcomes.

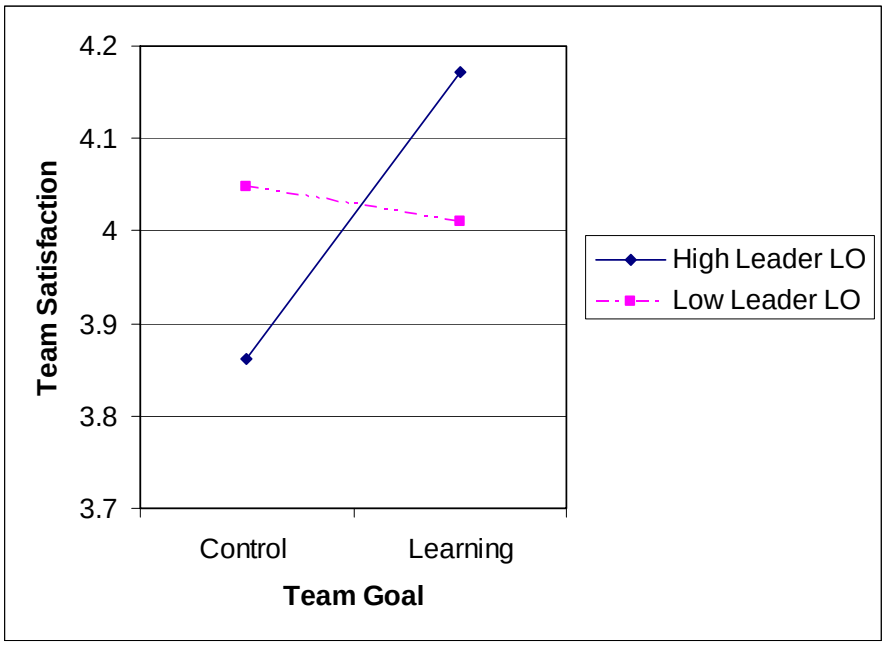

Figure 5. Interactive Effects of Learning Goal and Leader Learning Orientation on Team Satisfaction

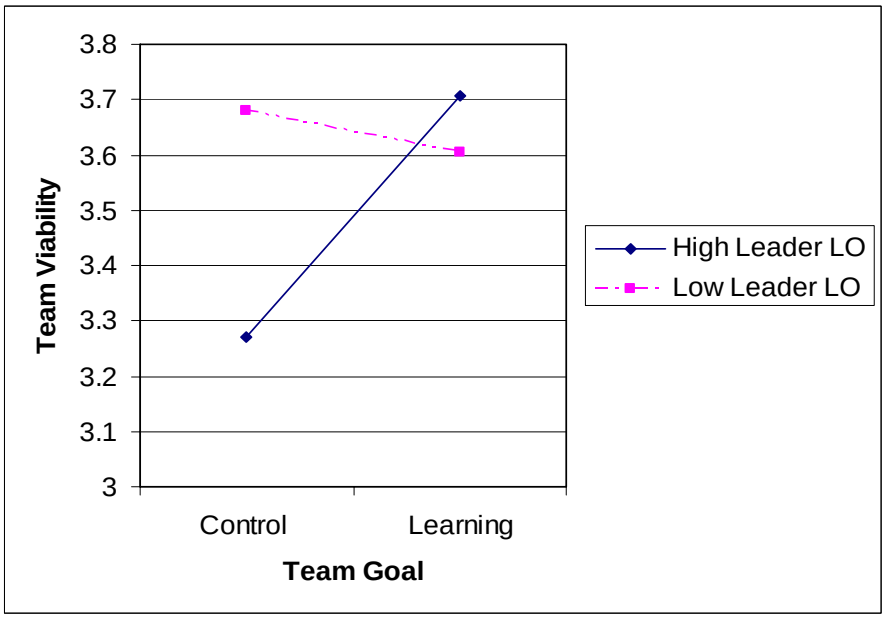

Figure 6. Interactive Effects of Learning Goal and Leader Learning Orientation on Team Viability

Theoretical Implications

Locke and Latham (1984) suggested that goals can offer a focus of collective effort and attention. Regarding goals, researchers have consistently shown that goals increase performance primarily through their effect on one's intentions about effort and persistence. That is, given that an individual has the requisite ability to perform a task, a goal can cue or direct attention to exert effort and persistence to achieve it. In a team context, logically a goal can thus facilitate the collective effort from all its members and persistence to achieve the team goal. Two meta-analytic studies by Evan and Dion (1991) as well as Mullen and Copper (1994) conclude that there is a small but positive relationship between group cohesion and group performance. Although these results seem explicit and promising, more work is needed to specify the conditions in which what type of goals have the most influence on team cohesion and team effectiveness, especially considering the multifaceted nature of team cohesion (Festinger, Schachter & Back, 1950; Zaccaro & McCoy, 1988) and team effectiveness (Hackman, 1987).

However, the present study found that there was no positive effect of a team performance goal on team task performance. This is actually consistent with the work of Kanfer and Ackerman (1989). In a study involving Air Forces trainees mastering a flight simulation, Kanfer and Ackerman found that a goal does not increase a person's performance as generally predicted by goal setting theory. Among all reasonable explanations for Kanfer and Ackerman's findings, one may lie in the content of the goal. They in fact assigned the trainees a performance goal that focused attention on a specific quantity or quality of something to be achieved. If the content of the goal assigned were

"learning" (i.e., finding suitable strategies in carrying out the task) instead of "performance" (i.e., achieving some specific outcomes) goals. Then the trainees could very possibly focus at least some of their attention on finding suitable strategies in carrying out the task rather than worrying about what their outcomes were going to be. Despite the fact that Kanfer and Ackerman's research was conducted at the individual level, their results appear to remain true at the team level. The tasks used in Kanfer and Ackerman's (1989) study and this study are both of a complex nature. That is, although all participants for this study received approximately one hour of training before beginning work on the DDD game, it was still unlikely that a team could master the task immediately given its complex nature.

A learning goal should more effectively increase performance when working on a complex task because it shifts the focus to task process in terms of strategy development and away from task outcome achievement. However, this effect cannot be detected easily in the initial stages because strategies developed from earlier experiences can only be applied to latter tasks performance. A learning goal typically gives individuals the specific assignment to develop strategies to accomplish a task. In this study, team members were told that they would be given a test after the DDD task to assess the extent to which they found some useful strategies to master the DDD task, namely, their learning performance. The experimental teams examined in this study were faced with the initial stages of the learning process given the fact that they were allowed to begin the task almost immediately after the training. Although results from the original analyses did not show a significant relationship ($\beta = .19$, n.s.) between a

learning goal and team learning performance, the post hoc analyses indicated that goal commitment played a moderator role in the relationships between team goals and team cohesion as well as in the relationships between team goals and team effectiveness outcomes. The post hoc analyses found that the relationship between a learning goal and team learning performance was actually significant ($\beta = .21$, $p < .05$) when goal commitment was entered into the model.

Moreover, Kozlowski et al.'s (1996) dynamic theory of leadership and team effectiveness proposes that a leader can influence the development and shape of *shared perceptual structures*, which is an alternative conceptualization used to describe team cohesion. The model proposed by Kozlowski and his colleagues illustrates that team cohesion is the critical factor that mediates the linkage between leader role behavior and team outcomes (*see* Kozlowski et al., 1996 for a complete description). Similarly, this study also examines the leader role as an essential factor in team cohesion. However, this study is the first to look at the leader's trait goal orientation instead of leader's role behavior or other dispositions. An individual's trait goal orientation is normally a more distal influence than observed behavior upon others in organizations; yet the importance of the trait goal orientation of leadership should not be neglected.

In addition, this study examines the interactive effects between team goals and leader's trait goal orientation in team cohesion. The results of the original analyses indicate there is no interactive effect between a team performance goal and leader's performance orientation on team task cohesion. However, the effect of a team learning goal on team task cohesion is more positive when the leader is high on learning

orientation than when the leader is low in learning orientation (as shown in Figure 4). To some extent these findings are consistent with Kerr and Jermier (1978), who proposed that a variety of individual, task, and organizational characteristics have been found to influence the relationships between leader behavior and team effectiveness outcomes. They suggested that some variables can actually act as "substitutes for leadership," tending to negate the leader's influence on team effectiveness outcomes. One organizational characteristic, formalization, was believed to have the tendency to neutralize the effects of a task-oriented leadership (Kerr & Jermier, 1978). Organizational formalization includes having explicit plans, goals, and areas of responsibility. A task-oriented leadership very likely shows behaviors that are performance-oriented because successful task accomplishment is typically what a task-oriented leader values. Performance orientation is a predilection for either maximizing performance, reducing mistakes, and meeting the expectation of key stakeholders (Gully & Phillips, 2005, in press). As a result, based on what Kerr and Jermier (1978) suggested, when there is a performance goal in place, a leader's performance orientation may have no further significant effects on the development of team cohesion given the fact that the existence of a team performance goal may neutralize whatever the leader's influences may have on team cohesion. This may be a possible reason for finding no significant interactive effects between a team performance goal and leader's performance orientation on team task cohesion.

Notwithstanding, I found that the effect of a team learning goal on team task cohesion is more positive when the leader is high in learning orientation than when the

leader is low in learning orientation. The learning goal in this study is the assignment to identify suitable strategies to enhance their defense. A learning orientation is generally posited to encourage adaptive behaviors and eventually lead to improved performance (Edmondson, 1999). A learning-oriented leader is hence very likely to show supportive behaviors and facilitate interactions in order to exchange and share information in teams when team members are trying to discover appropriate defense strategies. In this case, the organizational formalization such as having an explicit goal (i.e., learning goal) does not really neutralize the leader's influence on team cohesion. Instead, a learning-oriented leader reinforces the effect of a team learning goal on team cohesion, thus finding the effect of a team learning goal on team task cohesion is more positive when the leader is high on learning orientation than when the leader is low on learning orientation.

Incidentally, while the study finds no predicted interactive effect between a team performance goal and leader's performance orientation on team task cohesion, it nevertheless finds an interactive effect between a team performance goal and leader's performance orientation on team social cohesion ($\beta = .33$, $p < .05$), as shown in Figure 7. Although not hypothesized in this study, this unexpected finding on social cohesion yet again suggest more work is needed to specify the conditions in which what type of team cohesion can be effectively developed.

Fiedler's (1964) contingency model postulates that the performance of interacting groups is contingent upon the interaction of leadership style and situational favorableness. Regarding leadership style, it is logically influenced by the leader's trait goal orientation given the fact that goal orientation researchers have unanimously agreed

that certain trait goal orientation exhibits particular behaviors (Button, Mathieu & Zajac, 1996; Dweck & Leggett, 1988). Extending Fiedler's theory, the results of this study explore the interactive effects between team goals and leader's trait goal orientation on team processes and then eventually on team effectiveness outcomes. This study provides evidence that the leader's trait goal orientation does play a factor in team processes and team outcomes. The leader's trait goal orientation is critical even when there is a team goal as some have argued that goals can function as the substitute for leadership in some situations (Kerr & Jermier, 1978). For that reason, the results of this study provide an important component adding to our understanding of leadership phenomena.

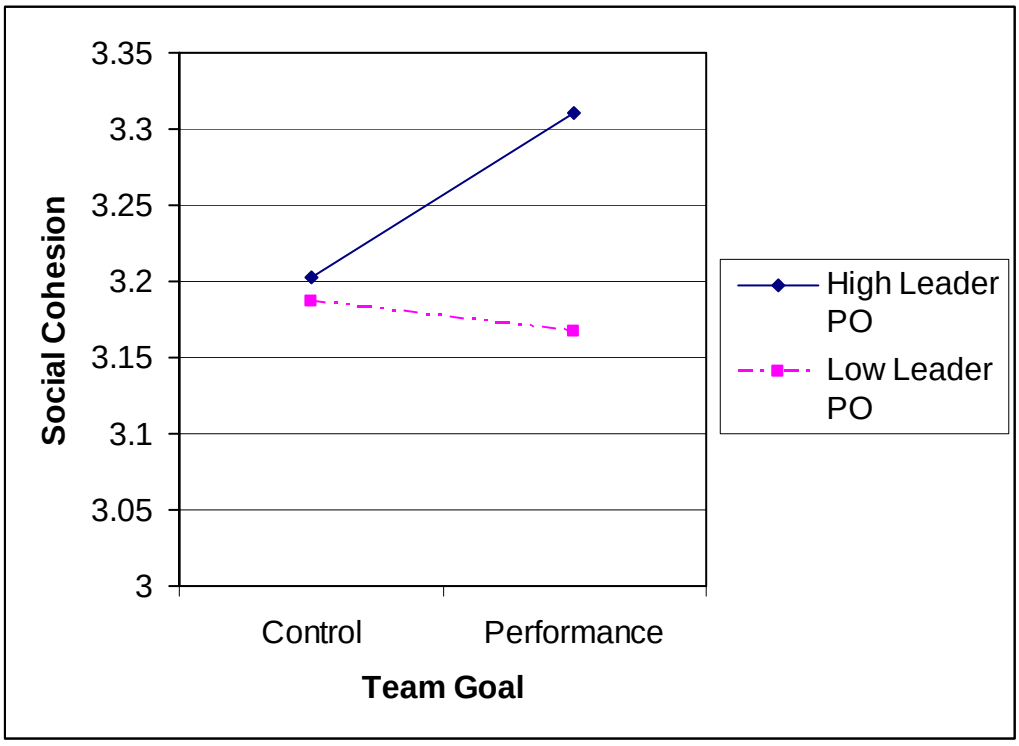

Figure 7. Interactive Effects of Performance Goal and Leader Performance Orientation on Team Social Cohesion

As for team cohesion, social cohesion is the product of personal attraction while task cohesion is a product of relations of mutual dependency created between team members associated for the attainment of common goals which cannot be attained effectively outside the team context (Tziner, 1982). As the results suggest, distinct patterns of behavior and interactions are essentially entailed by different types of cohesion. In particular, the study finds that only social cohesion significantly mediates the relationships between team learning goals and team viability. This finding contradicts assertions of more than half a century ago stating that the consequences of increasing cohesion are identical regardless of which specific component of cohesion is increased (Schachter, 1951). In addition, the finding offers some refutation to Zaccaro and McCoy's (1988) argument that both interpersonal attraction and commitment to the task are critical to cohesion-performance effect.

Practical Implications

There are at least three practical implications that arise from the results presented in this study. Given that the use of work teams continues to grow in the United States (Lawler, Mohrman & Ledford, 1995) and the foreign affiliates of U.S. multinationals (Kirkman & Shapiro, 1997), organizations are constantly concerned about team management issues. The management of teams formed for various purposes within the organization is frequently monitored from all perspectives—the common practice of 360^{o} assessment. It seems insightful to also place a team leader's trait goal orientation under scrutiny given the potential effects it can have on the team effectiveness outcomes.

Although a leader's personality and its effect on organizational outcomes have received some attention in the literature (Peterson et al., 2003), little is known about the leader's trait goal orientation. Organizations need to look for team leaders who possess the right trait goal orientation in order to maximize specific aspects of team effectiveness. In this study, the results of the original analyses show that if the organization is interested in increasing team viability, in addition to a team learning goal, it is beneficial to have a team leader high in learning goal orientation as well. For obvious reasons, one might be tempted to have a leader who is highly performance oriented because it is often important to impress stakeholders with clear end results within short periods of time. Indeed, if the task force has short-life nature and does not need to maintain long term existence for successful and efficient accomplishment, this may be warranted. The results of this study suggest that leader's learning orientation, in addition to a learning goal, can enhance team viability.

Moreover, the results of the supplementary analyses actually indicated that when goal commitment is ensured, a learning goal can positively influence team learning performance, team satisfaction, and team viability. The positive impact a learning goal may have on multiple team effectiveness outcomes should provide some suggestions to organizations in personnel selection.

Limitations and Suggestions for Future Research

First limitation of the study relates to the design of the experiment by purposely keeping the leader unaware of team goals. Some may argue that this design greatly limits

the generalizability of the study's results. In modern organizations, particularly in the business world, leaders are typically the persons who set goals for their teams. Although I have designed the study with different types of organizations in mind (i.e., military and government bureaucracy), this limitation shall and can be greatly reduced if the team leader was actually the person who announced the goal (as given by the experimenter) during the experimental task.

The results of this study indicate that there are nearly no relationships between team performance goals and team effectiveness outcomes. However, it should be noted that, even with a relatively small sample size for a team level study, a number of Team Goal × Leader Goal Orientation interactions were found to have positive effects on several team effectiveness outcomes. Specifically, the interactive effects between leader's learning goal orientation and a team performance goal were found to positively influence task performance, team satisfaction, and team viability and the interactive effects between leader's learning goal orientation and a team learning goal were found to positively influence team viability as well. However, these findings actually relate to the second limitation of this study. I failed to make predictions on the effects of mismatch between leader goal orientation and team goals. Even in modern organizations, it should be common to encounter situations when the leader has a different political agenda than what his or her team may have. This limitation has probably limited, at least to some extent, the study's generalizability. Future research should certainly explore the mismatch between leader goal orientation and team goals and look into what effects the mismatch may have on team process as well as on team effectiveness outcomes.

Generally, current theories and models of leadership have a belief that hierarchical leadership is always important even considering the fact that there may be something else in common among these theories and models of leadership. The leader's trait goal orientation, particularly its interactive effects with the goal conditions, should offer an interesting avenue for future leadership research.

Yet another limitation of this study was the decision not to explore the relationship between task and social cohesion. The conceptualization of team cohesion, consistent with previous research (e.g., Tziner, 1982; Zaccaro & Lowe, 1988), was based on a two dimensional operationalization in which task cohesion and social cohesion are neither mutually exclusive nor contradictory. Therefore, it is possible that teams (as can be the case with individuals) could, at least, be high or low on both dimensions. When teams are initially formed to perform tasks, it would be interesting to see which cohesion gets developed first and whether the first cohesion developed can be the foundation for the other's development. From a pragmatic perspective, it would seem that task cohesion would and should be developed first in organizations so teams can speedily maximize performance at the team level. Given the fact that organizations tend to value task cohesion because it directly relates to the work at hand, it is very likely that organizations would prefer task cohesion over social cohesion in their teams. However, social cohesion concerns interpersonal relationships and results of this study indicated that it mediates the effects of a team learning goal on team viability. Team viability is without doubt an important factor in organizational outcomes because turnover has been found to negatively impact organizational performance (Mathis & Jackson, 2003).

Results of the present study suggest that the interaction between a team learning goal and leader's learning orientation can positively influence team cohesion. However, can this task cohesion further be the foundation for social cohesion's development so that turnover can be minimized or reduced? Moreover, will teams high in both task cohesion and social cohesion outperform teams high in task cohesion only in all perspectives of team effectiveness as defined in this study? The results of this study are unable to provide definite answers to these questions given that teams in this study only worked on the task once, and while allowing the researcher to measure the different dimensions of team cohesion, it did not allow for the testing of the more distal consequences of different cohesion and the possible causal relationships between different cohesions. Unfortunately, very little extant theory (nor any empirical research) has suggested how task and social cohesion influence each other. Given the lack of a priori hypotheses about how team task cohesion and social cohesion may relate to each other, I choose to provide an empirical test for the predictions about how each team cohesion dimension might independently relate to team goals and team effectiveness outcomes. In this way, this study provided a statistically stronger test of the hypotheses for which there was adequate a priori theoretical support. However, it is suggested that a more comprehensive understanding of the team cohesion construct may result from future researchers' attempts to explore (both theoretically and empirically) how the different team cohesion dimensions might influence each other.

Finally, because this study was conducted in a laboratory context, future research needs to examine the external validity of these results. On the one hand, there were

certain features of this task and our participants that did achieve what Berkowitz and Donnerstein (1982) referred to as "mundane realism." Arguably, the fact is that the task was a simulated tactical decision-making task designed and used as part of US Air Force training (Hollenbeck et al., 2002), and the research participants were about the same age and had similar education levels as the military personnel who typically perform this role. Although the implications of poor performance on this task were not the same as they would have been for real military personnel actually performing the task, the awareness of cash bonuses that were available to the top performing teams indeed made them, to some extent, also psychologically engaged (in fact in many cases teams were so engaged in the task and the experimenter had to remind them not to be too loud in their conversation among team members during the task). Therefore, it is believed that the "psychological realism" was not so low that the results can be dismissed.

On the other hand, it is also worth noting that no study is completely generalizable (Mook, 1983). One should keep in mind the nature of the research question when assessing the relevance of external validity. This study is concerned with developing and testing an I-P-O model of team goal, leader goal orientation, team cohesiveness, and team effectiveness outcomes based on several theories in the literature. The laboratory serves as a meaningful venue for testing the hypotheses because it provided the control to manipulate the types of goals assigned and the ability to obtain objective performance measures. There was really little reason to believe that the laboratory would be an inappropriate context for theoretically driven, preliminary examination of what might happen in the field (Ilgen, 1986).

Given the short-life nature of the experiment, there was not enough time for teams to advance into the "norming" (Tuckman, 1965) stage of team development. In addition, the leaders in this study were not really given sufficient time to socialize with his or her team members. This design has probably caused finding no interactive effects between leader trait goal orientation and team goals on team social cohesion. It would be interesting to see what results will yield if the leaders were with the members throughout the experiment. After all, good theory often evolves over time from attempts to better understand the how, when, who, and where of its core propositions. In this study, I attempted to add to our understanding of the how, where, and when or who of team goals, leader goal orientations, and team cohesion in teams. In particular, this study examined the effects of team goals on both team cohesion and team effectiveness outcomes (i.e., how) in team settings (i.e., where) and the moderating influence of the leader's goal orientation (i.e., when or who). Hopefully, this research has provided a foundation that encourages future longitudinal research--as only through longitudinal investigations of these relationships will the team I-P-O model become even more theoretically meaningful and practically useful.

Summary of Findings Related to the Model

The current advance in the literature regarding the exploitation of goals at levels above and beyond the individual level has opened up many new avenues of research. A number of researchers have suggested that the linkages between goals and performance at the individual level are also present at other organizational levels. Assorted definitions

of leadership also add complications to higher organizational levels because there are typically leadership positions in organizations. As a result, various mediators and moderators as well as outcomes other than performance are yet to be identified.

This study sought to explore the relationships between team goals, team cohesion, and team effectiveness outcomes as well as the influence of the leader's goal orientations on the relationships between team goals and team cohesion. The findings of this study suggest that a team learning goal is positively related to team viability and social cohesion mediates the effects of a team learning goal on team viability. The linkage between team cohesion and team performance has been suggested and debated. This study did not find any significant relationship between team cohesion with performance in and of itself; however, this study was able to discover the linkage between a team learning goal, social cohesion, and team viability. This study also examined the effects of leader's goal orientation in the relationship between team goals and team cohesion. The findings indicate that the leader's learning goal orientation positively moderate the effect of a team learning goal on task cohesion. Together, these findings in turn suggest the multidimensionality of team cohesion and how and when different dimensions of team cohesion may be developed.

To my knowledge, this study represents the first attempt to investigate the effects of leader's goal orientation on team cohesion and sequentially team effectiveness outcome. I also believe this is the first study to investigate the relationships between team goals and team cohesion as well as the first to find the moderating effects of leader's goal orientation on team cohesion. While the I-P-O model proposed here

received only limited support, the findings nevertheless have opened up at least a new direction for future research in this area.

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APPENDIX A

DISCUSSION OF GOAL

We are almost ready to begin the Game because you have just received all the necessary training to perform well on the task.

(**For Performance Goal Team**)

The most important indicator of performance in DDD game is the defensive score obtained at the end of each game. Therefore, how well your team performs in DDD game is judged totally by team defensive score attained at the end of each DDD game. Whatever your team does, your goal should be achieving highest possible team defensive score. Of course, the cash prize will be awarded to the team with the highest defensive score.

(**For Learning Goal Team**)

Trainees in the Air Force have shown that a thorough learning of the nature of the task and identifying some good strategies are crucial to your defense. Therefore, your goal should be trying to improve your defense in this game by thoroughly learning about the nature of the task. After each game, we will give you a test to measure your learning. Therefore, your goal in DDD game should be learning the nature of the game as best as possible. Note that the cash prize is based on hoe much you have learned about the game, not how well you do on the game. In other words, your scores on the test count, not the defensive scores on the game.

Note: For teams with no goal, simply proceed to survey questions after training without any goal discussion.

APPENDIX B

LEADER FUNCTIONS

As the leader of the current team, you should know and perform some essential leadership works that are critical to team performance. These works are well supported in the leadership literature and have been empirically supported (Zaccaro, Rittman & Marks, 2001b):

- **Information search and structuring:** As leader of the team, you should systematically search, acquire, evaluate, and organize information regarding team operations, from both within and outside the team. For example: acquiring information about targets from team members and organize the information to the team's benefit in DDD tasks. In addition, you should take the initiatives to contact the experimenter for problems or questions when there are problems or questions while team members are focusing on their defense mission.

Although you will be able to see the whole situation across the task area on the screen, you are not able to identify any targets unless the target identities are transferred by one of the team members. Therefore, you can gather information either by asking members verbally or by asking them to manually transfer the target identities. The specific target can be pinpointed by using the coordinates from the top and left-hand side of the task area. That is, a specific location in the task area can be pointed out by reading the top coordinate and then the left coordinate. Besides, this information should then be used to what you judge to be the team's best advantage. For instance, glance at the task area and direct suitable vehicle that is either closest to it or with the adequate power level to attack the most imminent threat.

- **Information use in problem solving:** Leader should apply the acquired information to problem solving in the service of team. You should identify task needs and requirement, develop and evaluate possible solutions, and plan carrying out selected solutions. That is, you should be responsible for translating a mission into a workable plan that utilizes available team resources and perform several objectives for the team.

During the game, there will be four types of unknown targets among all other targets. They will show up as "U" signs with various symbols once they are identified. Each of them will have one specific power level like the rest of the targets in the game. Their power level will be consistent throughout the whole game. In other words, one of them will always have the power 0, one with the power 1, one with the power 3, and the other with the power 5. However, as a leader, you should come up with a way to organize members' effort to find out as soon as possible what each of these U targets is. The general rule is that an enemy in the restricted area will eat up your defense points while a friendly target should be left alone no matter where it is on the screen. Remember! A successful attack is attacking an enemy target anywhere in the forbidden zones with the vehicle of equal or higher power than the target.

- **Managing personnel resources:** Leader should motivate, coordinate, and oversee the individuals under your command—the team members. Beyond this, you are also responsible for training and developing the personnel resources under your command. For example, make sure everyone in the team is doing his/her job properly to achieve what you think the team should achieve.

  You should make sure all members on the team are fully attentive to the game. All members' effort should be directed towards the area that demands it the most. Given that you have the whole view of the scenario, you should give appropriate orders to team members in order to efficiently and effectively deploy members to the most troubled area.

- **Managing material resources:** Leader should also make sure that all the material resources of the team for team action (i.e., tanks, helicopters, jets, and AWACS under team members' control) are effectively used to defend the restricted area.

Above are the functions that you are expected to perform as a team leader. It is important that you take these responsibilities seriously because how you perform as a leader can and will be critical to the team's performance.

APPENDIX C

TEAM LEADER QUESTIONNAIRES

DDD LEADER QUESTIONNAIRE

Instructions:
The following survey contains several items regarding your attitude towards your team, your teammates, and the DDD task. You will complete the survey only when instructed by your team's experimenter. There are no right or wrong answers to the questions asked here. It is expected that there will be differences in attitudes among members of the same team; therefore, you should not share your answers with any other members of your team. All answers that you provide will be confidential, have no impact on your team's performance, and will not affect your eligibility for the cash prizes. **Make sure you stop wherever you see a stop sign after the question you have just answered on the survey; this is also a good place to check and make sure that the item number you stopped on matches with the correct number on your scantron form. Your experimenter will tell you when to continue.**

Post-Game Questions

Use the following 5-point scale to answer questions #1 - 16.

1 ----------	2 ----------	3 ----------	4 ----------	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your attitudes about the TEAM you worked with during the DDD GAME (Team Goal Orientation):

1. The things the team enjoyed most were the things they did best.
2. The opinions others had about how well the team could do certain things were important to the team.
3. The team felt smart when they did something without making any mistakes during the DDD game.
4. The team likes to be fairly confident that they can successfully perform a task before they attempt it.
5. The team likes to work on another DDD game that they have done well on just now.
6. The team feels smart when they can probably do the DDD game better than most other teams.
7. Even if they know that they did a good job on the DDD game, they are satisfied only if others recognize their accomplishments.
8. The team feels that it is important to impress others by doing a good job on the DDD game.

9. The opportunity to experience a challenging DDD game is important to the team.
10. When the team failed to complete a difficult job during the DDD game, they planed to try harder the next time they came across it.
11. The team preferred to work on tasks that forced them to learn new things during the DDD game.
12. The opportunity to learn new things was important to the team.

13. Team members did their best when they were working on a fairly difficult task during the DDD game.
14. When the team had difficulty solving a problem, the team enjoyed trying several different approaches to see which one would work.
15. On most jobs during the DDD game, the team believed that they could pretty much accomplish whatever they set out to accomplish.
16. The team believed that team performance on most tasks or jobs increased with the amount of effort the team put into them.

Use the following 5-point scale to answer questions #17 – 51.

1 ----------	**2 ----------**	**3 ----------**	**4 ----------**	**5**
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Answer the following questions regarding how your team worked together during the DDD game (Teamwork).

17. Team developed task strategy
18. Team was aware of progress toward goal
19. Team outlined specific goals
20. Team had a specific approach to task
21. Team set specific performance goals
22. Team spelt out specific course of action

23. Members monitored others' performance
24. Members were aware of what other members were doing
25. Members shared information with each other
26. Members checked with each other before interfering
27. Members distributed all information to other members

28. Members acknowledged others' uniqueness
29. Members gave emotional support to other members
30. Members completely trusted other members
31. Team was perceived as cohesive and "teamy" by those outside team
32. Members felt sense of identity
33. Members enjoyed working together
34. Members believed in their ability to do the job
35. Members had shared commitment to reaching goals

36. Members listened attentively to each other
37. Members sought input from silent team members
38. All members had an equal chance to participate in discussions
39. Members felt comfortable talking about controversial issues
40. Team did not make decision until everyone gave input

41. Team tried to identify causes of problems
42. Members discussed possible solutions
43. Consequences of actions were carefully considered
44. Team focused on factual information when problem solving

45. Team members would provide assistance to those who needed it when specifically asked.
46. Team members asked for help when needed rather than struggled
47. Team members provided assistance to others having difficulty even when not asked

48. Member of the team would neglects his or her own duties in the process of helping (R)
49. Team members failed to provide assistance to a member even when the member asked (R)
50. Assistance provider in the team ensured that the person who was assisted was aware of what had been done.
51. I am dedicated to my assigned role as a leader in this experiment.

Use the following 5-point scale to answer questions #52 - 57.

1	**2**	**3**	**4**	**5**
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern you when you worked with the team during the DDD game (Leader goal oriented behaviors).

52. I closely monitored our team defensive score by reading it aloud to the team several times during the DDD game.
53. I considered that it is important that the team does well on this DDD game.
54. I enjoyed being in charge of the DDD game.

55. I encouraged trying different approaches to work on the DDD game.
56. I let team members maneuvered their vehicles at their own discretion.
57. I asked questions during the DDD games in order to figure out the power level of all U targets.

APPENDIX D

TEAM MEMBER QUESTIONNAIRES

DDD TEAM MEMBER QUESTIONNAIRE

Instructions:

The following survey contains several items regarding your attitude towards your team, your teammates, and the DDD task. This survey contains several parts, each of which you will complete only when instructed by your team's experimenter. Some of the items appear in more than one part of the survey. This is because your answers to some of the items may change over time as you spend more time with your team and more time working on the task. There are no right or wrong answers to the questions asked here. It is expected that there will be differences in attitudes among members of the same team; therefore, you should not share your answers with any other members of your team. All answers that you provide will be confidential, will have no impact on your team's performance, and will not affect your eligibility for the cash prizes. **Make sure you stop wherever you see a stop sign after the question you have just answered on the survey; this is also a good place to check and make sure that the item number you stopped on matches with the correct number on your scantron form. Your experimenter will tell you when to continue.**

Part I. Post-Training Questions

Use the following 5-point scale to answer questions #1 - 32.

1	**2**	**3**	**4**	**5**
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your attitudes about the team with which you work.

(Team Satisfaction: 3 items)

1. I am satisfied with my present teammates.
2. I am pleased with the way my teammates and I work together.
3. I am very satisfied with working in this team.

(Team Viability: 12 items)

4. I believe my team approaches its task in an organized manner.
5. This team accomplished what it set out to do.
6. Our team does not achieve as much as I thought we would. (R)
7. I feel that working with this particular team will enable me to attain my personal goals.
8. I believe that my personal well being has been improved as a result of participating in this team.
9. This team should not continue to function as a team. (R)
10. This team is not capable of working together as a unit. (R)
11. This team probably should not work together anymore. (R)
12. I believe my team made an important contribution to the success of the task.
13. I haven't learned very much from participating in this team. (R)
14. The team has influenced me in a lot of positive ways.
15. I don't think this team has been very helpful to me. (R)
16. I am willing to put in a great deal of effort beyond that normally expected in order to help this team be successful.
17. I would talk up this team to my friends as a great team to work with.
18. I feel very little loyalty to this team. (R)
19. I would accept almost any type of task assignment in order to keep working with this team.
20. I would be proud to tell others that I am part of this team.
21. I could just as well be working with a different team as long as the type of task was similar. (R)
22. This team really inspires the very best in me in the way of task performance.
23. I am extremely glad that I was placed into this team rather than another.
24. I really care about the fate of this team.
25. For me this is the best of all possible teams for which to complete the task.
26. Getting myself placed into this team was a definite mistake on my part. (R)

27. Overall, I am satisfied with my team
28. In general, I don't like my team. (R)
29. I would be willing to work with this team in the future.
30. If we had a choice, I would definitely want to work with a different team for future decision-making exercises. (R)
31. Overall, I am satisfied with the way my team made decisions.
32. In general, I don't like the way decisions were made in my team. (R)

Use the following 5-point scale to answer questions #33 - 40.

1		**2**		**3**		**4**		**5**
Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree

The following questions concern your attitudes about the team with which you work.

33. Members of this team are rather indifferent about this team. (R)
34. Members of this team are rather easy to socialize with when we are not working on the DDD task or surveys.
35. Members of this team can definitely spend some time together when the experiment is done.
36. Members of this team would use the break time to socialize with one another on the team.

37. Members of this team defended each other rather than only defending themselves from the enemy targets during the training game.
38. Members of this team helped each other during the training game.
39. Members of this team got along with each other great during the training and the break.
40. Members of this team stuck together during the break even it was not required by the experiment.

Use the following 5-point scale to answer questions #41 - 51. Rate your team on the 5-point scales as follows (Social Cohesion: 11 items):

1 ---------- 2 ---------- 3 ---------- 4 ----------5

41. Cold----------Warm
42. Unpleasant---------- Pleasant
43. Dislikable ---------- Likable
44. Courteous ---------- Discourteous
45. Undependable ----------Dependable
46. Friendly ---------- Unfriendly
47. Bold----------Cautious
48. Causal ---------- Deliberate
49. Liberal---------- Conservative
50. Cool----------Serious
51. Please rate from 1 to 5 the degree to which you feel that your team is a “close” group (5 being the “closest” one).

Use the following 5-point scale to answer questions #52 - 61.

1 ----------	2 ----------	3 ----------	4 ----------	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your attitudes about the team task you are working on.

41. Our team is united in trying to reach its goal for performance
42. Any mistakes that happen during the task will be a responsibility of the team.
43. Everyone in the team is trying to help if members have problems.
44. Members of this team communicate freely about each others' status during tasks.

(Task Cohesion: 6 items)

45. It is personally important that this team succeeds.
46. I am willing to put in a great deal of effort beyond what is normally expected in order to keep our defensive score high.
47. Doing well in this experiment is more important than doing well in other experiments in which I have participated.
48. I would definitely talk up this experiment to my friends as a great project to work on.
49. The results of this experiment have no relevance to me at all. (R)
50. There is indeed some personal benefit accrued by participating in this experiment.

Part II. Post-Game Questions

Use the following 5-point scale to answer questions #62 - 77.

1	**2**	**3**	**4**	**5**
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your attitudes about the TEAM you worked with during the DDD game.

62. The things our team enjoyed most during the DDD game were the things we did best.
63. The opinions our team leader has about how well our team can do certain things are important to the team.
64. Our team felt smart when we did something without making any mistakes during the DDD game.
65. As a team, we like to be fairly confident that we can successfully perform the DDD game before we attempt it.
66. The team likes to work on another DDD game that we have done well on just now.
67. The team feels smart when we can probably do the DDD game better than most other teams.
68. Even if we know that we did a good job on the DDD game, we are satisfied only if others recognize our accomplishments.
69. The team feels that it's important to impress others by doing a good job on the DDD game.

70. The opportunity to experience a challenging DDD game was important to the team.
71. When we failed to complete a difficult job during the DDD game, we planed to try harder the next time we came across it.
72. We preferred to work on tasks that forced us to learn new things during the DDD game.
73. *The opportunity to learn new things was important to the team.*
74. We did our best when we were working on a fairly difficult task during the DDD game.
75. When we had difficulty solving a problem, we enjoyed trying several different approaches to see which one would work.
76. On most jobs during the DDD game, team members believed that they could pretty much accomplish whatever they set out to accomplish.
77. The team believed that team performance on most tasks or jobs increased with the amount of effort the team put into them.

Use the following 5-point scale to answer questions #78 - 82.

1	**2**	**3**	**4**	**5**
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Answer the following questions in regard to the TEAM GOAL that your team has for the DDD game (Goal Commitment: 5 items).

78. It's hard to take this goal seriously. (R)
79. Quite frankly, I don't care if I achieve this goal or not. (R)
80. I am strongly committed to pursuing this goal.
81. It wouldn't take much to make me abandon this goal. (R)
82. I think this goal is a good goal to shoot for.

Use the following 5-point scale to answer questions #83 - 90.

1	**2**	**3**	**4**	**5**
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your attitudes about the team with which you work.

83. Members of this team are rather indifferent about this team. . (R)
84. Members of this team are rather easy to socialize with when we are not working on DDD task or surveys.
85. Members of this team can definitely spend some time together when the experiment is done.
86. Members of this team would use the break time to socialize with one another on the team.

87. Members of this team defended each other rather than only defending themselves from the enemy targets during the training game.
88. Members of this team helped each other during the training game.
89. Members of this team got along with each other great during the training and the break.
90. Members of this team stuck together during the break even it was not required by the experiment.

Use the following 5-point scale to answer questions #91 - 101. Rate your team on the 5-point scales anchored as follows (Social Cohesion: 11 items):

1 ---------- 2 ---------- 3 ---------- 4 ----------5

91. Cold ----------Warm
92. Unpleasant ---------- Pleasant
93. Dislikable---------- Likable
94. Courteous---------- Discourteous
95. Undependable ----------Dependable
96. Friendly---------- Unfriendly
97. Bold---------- Cautious
98. Causal ---------- Deliberate
99. Liberal---------- Conservative
100. Cool ----------Serious
101. Please rate from 1 to 5 the degree to which you feel that your team is a “close” group (5 being the “closest” one).

Use the following 5-point scale to answer questions #102 - 111.

1 ----------	2 ----------	3 ----------	4 ----------	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your attitudes about the team task you are working on.

91. Our team is united in trying to reach its goal.
92. Any mistakes that happen during the task will be a responsibility of the team.
93. Everyone in the team is trying to help if members have problems.
94. Members of this team communicate freely about each others' status during tasks.
95. It is personally important that this team succeeds.
96. I am willing to put in a great deal of effort beyond what is normally expected in order to keep our defensive score high.
97. Doing well in this experiment is more important than doing well in other experiments in which I have participated.
98. I would definitely talk up this experiment to my friends as a great project to work on.
99. The results of this experiment have no relevance to me at all. . (R)
100. There is indeed some personal benefit accrued by participating in this experiment.

Use the following 5-point scale to answer questions #112 - 126.

1 ----------	2 ----------	3 ----------	4 ----------	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your attitudes about the team with which you work.

(Team Satisfaction: 3 items)

101. I am satisfied with my present teammates.
102. I am pleased with the way my teammates and I work together.
103. I am very satisfied with working in this team.

(Team Viability: 12 items)

104. I believe my team approaches its task in an organized manner.
105. This team accomplished what it set out to do.
106. Our team does not achieve as much as I thought we would. (R)
107. I feel that working with this particular team will enable me to attain my personal goals.
108. I believe that my personal well-being has been improved as a result of participating in this team.
109. This team should not continue to function as a team. (R)
110. This team is not capable of working together as a unit. (R)
111. This team probably should not work together anymore. (R)

112. I believe my team made an important contribution to the success of the task.
113. I haven't learned very much from participating in this team. (R)
114. The team has influenced me in a lot of positive ways.
115. I don't think this team has been very helpful to me. (R)

Use the following 5-point scale to answer questions #127 - 143.

1		**2**		**3**		**4**		**5**
Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree

127. I am willing to put in a great deal of effort beyond that normally expected in order to help this team be successful.
128. I would talk up this team to my friends as a great team to work with.
129. I feel very little loyalty to this team. (R)
130. I would accept almost any type of task assignment in order to keep working with this team.
131. I would be proud to tell others that I am part of this team.
132. I could just as well be working with a different team as long as the type of task was similar. (R)
133. This team really inspires the very best in me in the way of task performance.
134. I am extremely glad that I was placed into this team rather than another.
135. I really care about the fate of this team.
136. For me this is the best of all possible teams for which to complete the task.
137. Getting myself placed into this team was a definite mistake on my part. (R)

138. Overall, I am satisfied with my team
139. In general, I don't like my team. (R)
140. I would be willing to work with this team in the future.
141. If we had a choice, I would definitely want to work with a different team for future decision-making exercises. (R)
142. Overall, I am satisfied with the way my team made decisions.
143. In general, I don't like the way decisions were made in my team. (R)

Use the following 5-point scale to answer questions #144 - 149.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The following questions concern your formal team leader with whom you worked during the DDD game (Leader goal oriented behaviors).

144. The team leader closely monitored our team defensive score by reading it aloud to us several times during the DDD game.
145. The team leader seemed to consider that it is important that we do well on this DDD game.
146. The team leader seemed to enjoy being in charge of the DDD game.

147. The team leader encouraged trying different approaches to work on the DDD game.
148. The team leader seemed to let team members maneuver their vehicles at their own discretion.
149. The team leader asked questions during the DDD games to figure out the power level of all U targets.

Use the following 5-point scale to answer questions #150 - 183.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Answer the following questions regarding how your team worked together during the DDD game.

150. My team developed a task strategy.
151. My team was aware of its progress toward the team goal.
152. My team outlined specific goals.
153. My team had a specific approach to task.
154. My team set specific performance goals.
155. My team spelt out a specific course of action.

156. The members of my team monitored each others' performance.
157. The members of my team were aware of what other members were doing.
158. The members of my team shared information with each other.
159. The members of my team checked with each other before interfering.
160. The members of my team distributed all information to other members.
161. The members of my team acknowledged others' uniqueness.
162. The members of my team gave emotional support to other members.
163. The members of my team completely trusted other members.
164. My team would probably be perceived as cohesive and "teamy" by those outside of the team.

165. The members of my team felt a sense of identity.
166. The members of my team enjoyed working together.
167. The members of my team believed in their ability to do the job.
168. The members of my team had a shared commitment to reaching the team's goals.

169. The members of my team listened attentively to each other.
170. The member of my team sought input from silent team members.
171. All members of my team had an equal chance to participate in discussions.
172. The members of my team felt comfortable talking about controversial issues.
173. My team did not make decisions until everyone gave input.

174. My team tried to identify causes of problems.
175. The members of my team discussed possible solutions.
176. Consequences of actions were carefully considered by my team.
177. My team focused on factual information when problem solving.

178. Team members provided assistance to those who needed it when specifically asked.
179. Team members asked for help when needed rather than struggled.
180. Team members provide assistance to others having difficulty even when not asked
181. Member of the team would neglects his or her own duties in the process of helping (R)
182. Team members failed to provide assistance to a member even when the member asked (R)
183. Assistance provider in the team ensured that the person who was assisted was aware of what had done.

Use the scales below each item to respond to questions #184 - 187. MAKE SURE ALL OF YOUR ANSWERS ARE ON THE CORRECT LINE OF YOUR SCANTRON.

184. Was there a **formal** leader in your team? **(if you answer yes, please provide an answer to question #185)**
    1=Yes
    2=No

185. Which DM is the **formal** leader in your team?
    1=DM1
    2=DM2
    3=DM3
    4=DM4
    5=DM0

186. Was there an **informal** leader in your team (i.e., someone who while not formally assigned the role of team leader by the experimenter proved to be a leader to your team)?
    1=Yes **(if you answer yes, please provide an answer to question #187)**
    2=No

187. Which DM emerged as the informal leader in your team?
    1=DM1
    2=DM2
    3=DM3
    4=DM4
    5=DM0

OK, we are almost done with the survey. Please answer the following two questions carefully.
MAKE SURE ALL OF YOUR ANSWERS ARE ON THE CORRECT LINE OF YOUR SCANTRON

188. After the training and before the DDD game, did the experimenter tell you that your goal should be focusing on the learning or performance perspective of the game?
    1 = learning
    2 = performance
    3 = neither

189. How is the cash prize going to be based on?
    1 = the score on the test that will be given at the end of the experiment
    2 = the defensive score attained at the end of the DDD game
    3 = random draw from all experiment teams

End of survey. Thanks for your participation!
Make sure your last response is #189 on your Scantron.

VITA

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Porter, C. O. L. H., Yu, R. C, Gogus, C. I. & Keng, J. C. (2005). Demonstrating the value of teamwork: The effects of backing up behaviors on individual and team performance. Paper to be presented at the 65th Annual Meeting of the National Academy of Management, Honolulu, HI.

Porter, C. O.L. H., Gogus, C. I., Keng, J. C. & Yu, R. C. (2005). The moderating effects of legitimacy of need on the effects of teamwork on team performance. Poster to be presented at the 20th Annual Conference for the Society of Industrial & Organizational Psychology, Los Angeles, CA.

Porter, C. O. L. H., Gogus, C. I., Simmons, A. L. & Yu, R. C. (2004). The role of team goal orientation in the management of goal-performance discrepancies in teams. Paper presented at the 64th Annual Meeting of the National Academy of Management, New Orleans, LA.